

The American STATISTICIAN

UNIVERSITY
OF MICHIGAN

OCT 23 1950

BUSINESS ADMINISTRATION
LIBRARY

The news publication of the
AMERICAN STATISTICAL ASSOCIATION

OCTOBER, 1950

Volume 4, No. 4

35 CENTS

REPORT OF THE COMMITTEE ON ELECTIONS	1	
NEWS	2, 26, 28	
THE ILLINOIS STATISTICS CONFERENCE	5	
SO YOU'RE GOING TO GIVE A PAPER	6	
110th ANNUAL MEETING PROGRAM	9	
STATISTICS FOR ENGINEERS AT PURDUE	Irving W. Burr	19
THE EFFECTS OF CALENDAR SHIFTS ON SERIES		
OF MONTHLY DATA	Charles E. Armstrong	20
THE INTERNATIONAL TECHNICAL COOPERATION		
PROGRAM OF THE BLS	Thomas F. Mosimann	22
ANOTHER OPINION CONCERNING STATISTICAL TRAINING		
BELOW THE COLLEGE LEVEL	William Dowell Baten	24
PREPARATION OF EFFECTIVE LANTERN		
SLIDES	L. S. Bonnell	25
QUESTIONS AND ANSWERS		
Edited by Frederick Mosteller	27	
NEWS ABOUT MEMBERS	29	
CHAPTER NOTES	30	



8 new books on theoretical and applied statistics

*STATISTICAL DECISION FUNCTIONS

By ABRAHAM WALD, *Columbia University*. The first book-length treatment of the foundations of a recently developed general theory. Two important restrictions have handicapped previous statistical theories: (1) Experimentation was assumed to be carried out in a single stage, and (2) The decision problems were restricted to problems of testing a hypothesis, and of point and interval estimation. The theory in this book is free from both these restrictions. The design of experimentation is treated as part of the general decision function; and the theory makes possible multi-stage experimentation, including the general multi-decision problem. *August 1950. 179 pages. \$5.00.*

THEORY OF MENTAL TESTS

By HAROLD GULLIKSEN, *Educational Testing Service, Princeton, N. J.* Presents the formulas and fundamental ideas on which mental tests are based, with emphasis on the reasoning which led to the formulas. It also shows how changing various factors affects the reliability and validity of a test. Several helpful, original contributions are included. *October 1950. 486 pages. \$6.00.*

*STATISTICS: A Mathematical Treatment with Applications to Engineering and Industrial Problems.

By A. HALL, *University of Copenhagen*. This book covers a large part of the statistical theory developed during the last fifty years and proved to be of practical value. Great care has been taken to give a simple and coherent mathematical exposition of the theory, without using advanced mathematics. Practical examples illustrate every important theorem. *Approx. 654 pages. Prob. \$7.50. In Press.*

*TECHNOLOGICAL APPLICATIONS OF STATISTICS

By L. H. C. TIPPETT, *British Cotton Industry Research Association*. This new book emphasizes and illustrates the practical points that come up in applying statistics to technology, and the practical importance of the mathematical assumptions involved. The author covers not only control charts and sampling inspection but also the analysis of variance and design of experiments. *November 1950. Approx. 188 pages. Prob. \$3.00.*

*CONTRIBUTIONS to MATHEMATICAL STATISTICS

By R. A. FISHER. *1950. 656 pages. \$7.50.*

*EXPERIMENTAL DESIGNS

By WILLIAM G. COCHRAN and GERTRUDE M. COX. *1950. 454 pages. \$5.75.*

*AN INTRODUCTION TO PROBABILITY THEORY AND ITS APPLICATIONS. Volume I

By WILLIAM FELLER. *1950. 419 pages. \$6.00.*

*SOME THEORY OF SAMPLING

By W. EDWARDS DEMING. *1950. 602 pages. \$9.00.*

*WILEY PUBLICATIONS IN STATISTICS, WALTER A. SHEWHART, Editor

Send for copies on approval.

JOHN WILEY & SONS, Inc.

440 Fourth Avenue

New York 16, N. Y.

The American STATISTICIAN

OCTOBER, 1950, VOL. IV, NO. 4

The news publication of the
American Statistical Association

OFFICERS

President: Samuel S. Wilks; *President-elect:* Lowell J. Reed; *Past President:* Simon Kuznets; *Directors:* Gertrude M. Cox, W. Edwards Deming, Cyril H. Goldin, Frederick F. Stephan, Willard L. Thorp, Louis L. Thurstone; *Vice-Presidents:* Dorothy S. Brady, Harold A. Freeman, Philip M. Hauser; *Secretary-Treasurer:* Samuel Weiss; *Council:* Charles M. Armstrong, Waite S. Brush, Donald R. G. Cowan, M. I. Gershenson, Morris H. Hansen, Howard L. Jones, Thomas J. Mills, Paul R. Rider, David Schneider, John R. Stockton, Eliot J. Swan, John Tukey, W. Allen Wallis, Sylvia C. Weyl.

EDITORIAL COMMITTEE

Sylvia Castleton Weyl, editor; Churchill Eisenhart, Morris Hansen, Samuel P. Hayes, Jr., Lester S. Kellogg, Lila F. Knudsen, Julius Lieblein, Will Lissner, Harry V. Roberts, Morris Ullman.

Department Editors:

Questions and Answers

Frederick Mosteller

Presentation Problems

Kenneth W. Haemer

Correspondents: Albany—David M. Schneider; Austin—Stella Traweek; Central New Jersey—Willard C. Thompson; Chicago—Robert E. Bruce; Cincinnati—Lee M. Welsh; Columbus—Rosemary Tague; Connecticut—D. F. Votaw; Cuba—Hugo Vivo; University of Illinois—Robert Ferber; Oklahoma City—Everett P. Truex; Philadelphia—Mary McDermott; New York—Louise C. Mann; Washington, D. C.—Margaret Gurney; Government—Virginia Venneman; Latin America—Francisco de Abrisqueta; United Nations—F. Marguerite Nowak.

Entered as second class matter March 11, 1938, at the post office at Washington, D. C., under act of March 3, 1897. The American Statistician is published five times a year—February, April, June, October and December—by the American Statistical Association, Editorial Office: 1108 16th Street, N.W., Washington 6, D. C. Subscription rate: one dollar and fifty cents a year or twenty-five cents per copy.

REPORT OF THE COMMITTEE ON ELECTIONS

In accordance with the provisions of Section 3, Article VIII, of the Constitution, the Committee on Elections of the American Statistical Association submits the following slate of nominees:

President-Elect Ayness Joy Wickens

Vice-President (3 years) Morris A. Copeland
(One to be Elected) Lester S. Kellogg

Directors (3 year term) Harold F. Dorn
(Two to be Elected) Paul S. Olmstead
Ralph J. Watkins
Holbrook Working

Respectfully submitted,

FREDERICK C. MILLS
WALTER A. SHEWHART
LOWELL J. REED, Chairman

THE CONSTITUTION SPECIFIES THAT:

"These nominations shall be published in the next news bulletin. Additional nominations may be made within five weeks after this publication by petition signed by at least 25 members and submitted to the Secretary-Treasurer."

"On or before November 15, the Secretary shall mail to the members of the Association a brief biographical sketch of each nominee with a preferential ballot for the election of officers from among the persons so nominated."

In order to provide sufficient time for additional nominations by the membership the report of the Committee on Elections printed here was distributed by mail to the entire membership at the beginning of August 1950.

NEWS

Graphic presentation salon—Ownership of 'Biometrics' transferred—Chicago Chapter sponsors party for statisticians at Annual Meeting—meetings and conferences—Electronic Computers—Calcutta Statistical Center—new publications

Graphic Presentation "Salon"

To encourage a wider exploration of graphic methods, especially to promote excellence in chart making, the Association is sponsoring a Graphics Competition for the next Annual Meeting. Displays of graphics have been a familiar feature of past meetings, but it is hoped by this competition to stimulate wider active participation, and perhaps to unfold to general view some new devices and techniques in a field in which interest is not always matched by skill and mastery.

The following rules will cover the Graphics Competition:

1. *Eligibility*—All members or organizations represented by members will be eligible to submit entries. Competitors may submit any number of entries, but the number to be exhibited will be determined by the Committee.

2. *Entries*—will be classified as follows:

Class 1. Mathematical charts or graphs

Class 2. Organization charts and similar schematic diagrams

Class 3. Pictorial charts and "pictograms"

Class 4. Statistical maps

Class 5. General (line charts, bar charts, etc.)

3. *Basis of Award*—Entries will be judged on the basis of criteria appropriate to their classification. The major criteria are: originality of graph concept, utilization of graphic concept (extent of applicability), forcefulness and clarity in conveying information in graphic terms, design (composition and color) and drafting technique.

4. *Selection of Award Winners*—Awards will be made by a Committee of judges selected by the Chairman of the Association's Committee on Presentation. Award winners will be announced at the final general session at the Annual Meeting.

5. *Submission of Entries*—The following information should be included in each notice of submission of an entry:

a. Name and address of participant

b. Organization represented, if any

c. Title of entry

d. Dimensions, and other appropriate descriptive information

All interested members are urged to participate in the Graphics Competition and to communicate their intention to do so as soon as possible to: Chairman, Presentation Committee, American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.

Plans for Future Annual Meetings

December 1951—Boston.

December 1952—Chicago.

December 1953—Washington, D. C.

WANTED: A Copy of "Common Stock Indexes"

Common Stock Indexes—Second edition by Alfred Cowles, III, and Associates, is wanted urgently for a middle western business library.

Anyone who has a copy to spare should communicate with the office of the Secretary of the American Statistical Association.

Ownership of "Biometrics" Transferred to the Biometric Society

A contract has been signed by The American Statistical Association and the Biometrics Society by which the periodical "Biometrics" is transferred to the Society beginning with the March 1950 issue.

The Society has assumed all obligations for the publication and production of the March 1950 and subsequent issues of the periodical and will continue to make the publication available to A. S. A. members at a special reduced subscription rate.

If, at any time before December 1954, the Society should decide to discontinue the publication of "Biometrics" it will notify The American Statistical Association of this intention and upon written request will transfer and reassign to the Association all rights and titles of "Biometrics."

A special provision has been made by which the title page of "Biometrics" will give appropriate recognition for the support given to the journal in its initial years by The American Statistical Association and its Biometrics Section. It has also been arranged that one member of the Editorial Board of "Biometrics" may be nominated by the Biometric Section of the Association to serve for a term of three years, subject to the approval of the Editor of "Biometrics."

American Association for the Advancement of Science—December 1950 Meeting

The 117th Meeting of the AAAS will be held in Cleveland, Ohio, December 26-30, 1950. Sessions which might be of interest to statisticians include:

Section A—Mathematics:

Symposium on applications of mathematics—December 30

Section B—Physics:

Four sessions: a) "Fifty Years of the Quantum Theory"—December 27

"Scientific Implications of Nuclear Phenomena in the Fields of Astrophysics, Geophysics, and Biophysics"—December 27-28

Section C—Botanical Sciences:

A two-session symposium on "The Structure and Analysis of Plant Communities"—December 30

Section K—Social and Economic Sciences:

Three symposia or panel discussions: a) "Factors Determining City Growth;" b) "Growth of the Cleveland Area;" c) "Human Ecology," all programs, December 28

Societies Meeting with AAAS
The Eastern North American Region of the Biometric Society will have a number of joint meetings with the AAAS from December 27 through the 29th. The Foundation for the study of cycles will meet on the 27th.

German Statistical Society Meeting

The German Statistical Society will have its 50th Annual Meeting in Berlin November 8 and 9, 1950. Two of the three sessions planned will be devoted to discussions of statistical quality control in industry. Details of the program may be obtained from Dr. Wagner, German Statistical Society, Rosenheimerstrasse 130, Munich 8, Germany

Maurice W. M. Yeatts, 1894-1950

Word has been received of the death early in August of Maurice W. M. Yeatts, Registrar-General and Census Commissioner of India. Yeatts made many lasting friends among American statisticians when, as a Rockefeller Foundation fellow, he studied census methods in the United States, prior to the Indian census of 1941 of which he had charge. He regarded his stay here as the happiest time of his life, and it was his constant hope to return to this country. After a distinguished and diversified career in the Indian Civil Service he retired to his native Scotland about two years ago, only to be requested by the new Government of India to return to conduct the census forthcoming for 1951. In that capacity he was one of 27 British civilians still working for the Indian Government.

Conference on Scientific Method

Roosevelt College and the Philosophy of Science Association will conduct a two-day conference on "What is Scientific Method?" at Roosevelt College in Chicago on Friday and Saturday, October 20 and 21, 1950. Principal speakers will be Professor Sebastian Littauer, Columbia University; Nicholas Rashevsky, University of Chicago; Howard Becker, University of Wisconsin; and Thomas Cowan, Wayne University.

For further information, please write either to Professor Morris Goran, Roosevelt College, 430 S. Michigan Ave., Chicago 5, Illinois, or to Professor Russell L. Ackoff, Wayne University, Detroit 1, Michigan.

Inter-American Seminar for Bio-Statistics

An Inter-American Seminar for Biostatistics is being held in Santiago, Chile, from September 25 to December 15, this year. The seminar is organized and sponsored by the Government of Chile in cooperation with the United Nations Statistical Office, the Economic Commission for Latin America, the World Health Organization, the Pan American Sanitary Bureau, the Inter-American Statistical Institute, and the U. S. National Office of Vital Statistics.

The seminar is organized to provide a means for training and the interchange of technical knowledge in the fields of vital and health statistics, and to inform technicians of the recommendations, methodological studies and interests of international agencies concerned with these problems. The objective is to assist countries in developing more adequate statistical systems to serve their own national as well as international needs.

Society of Military Accountants and Statisticians

The Society of Military Accountants and Statisticians was organized early in 1949 in San Antonio, Texas. Its purpose is "to afford a means by which members of the accounting and statistical professions who are or have been commissioned or warrant officers (active, inactive, reserve, or retired) of the Armed Forces of the United States, may, through combined action, the application of advanced knowledge, and the constant endeavor to establish simplified and more uniform methods, assist in maintaining the highest standards in military accounting and the collection and interpretation of statistical data, stimulate the interest of all personnel of the Armed Forces in the accounting and allied professions, and continuously increase the value of the professions to the National Military Establishment."

Additional information about this Society may be obtained by writing to the National Secretary, Society of Military Accountants and Statisticians, 327 Robinhood Place, San Antonio, Texas.

STATISTICIANS INVITED TO INFORMAL PARTY DURING ANNUAL MEETING

The Chicago Chapter of the Association is sponsoring an informal party on Wednesday evening, December 27, at 8 P.M. at the Congress Hotel. All members of the ASA and participating societies are invited. Come and bring your family. Tickets will be on sale at the registration desk.

Research Fellowships in Psychometrics

The Educational Testing Service is offering for 1951-52 its fourth series of research fellowships in psychometrics leading to the Ph.D. degree at Princeton University, the two fellowships each carry a stipend of \$2,375 a year and are normally renewable.

Fellows will be engaged in part-time research in the general area of psychological measurement at the offices of the Educational Testing Service and will, in addition, carry a normal program of studies in the Graduate School. Competence in mathematics and psychology is a prerequisite for obtaining these fellowships. Information and application blanks may be obtained from: Director of Psychometric Fellowship Program, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

New Electronic Computers SEAC and SWAC

The National Bureau of Standards this year completed two high speed electronic computers. The SEAC (Standards Eastern Automatic Computer) was dedicated in May and is located in Washington. The SWAC (Standards Western Automatic Computer) was dedicated in August and is located at the University of California at Los Angeles. The bureau is, therefore, now able to supply high speed computing services on both coasts.

Although they are both high speed and both electronic there are significant differences between the SEAC and the SWAC. Arithmetic operations are accomplished in serial fashion by the SEAC and in parallel by SWAC. For example, SEAC handles one pair of digits at a time when it adds determining for each pair whether or not there is a "carry" digit to incorporate with the next pair of digits; SWAC determines the sums of all the digits in the operands simultaneously, remembers which pairs give carries and then adjusts for the carries where necessary.

The high speed memory in the SWAC is electro-static, at present most of SEAC's memory is of the mercury delay line type with only a small experimental electrostatic section.

Both machines represent important additions to the small family of high speed, general purpose digital computers. Machines of their type will undoubtedly have an important influence on statistics in the future. The SEAC and SWAC under the jurisdiction of a scientific and objective agency such as the Bureau of Standards should prove extremely useful in determining just what their influence is likely to be.

CORRECTION

National Income Statistics

The publication "National Income Statistics of Various Countries 1938-1948" is a publication of the Statistical Office of the United Nations, the second volume in a series devoted to national income.

The original news item in the June-July 1950 issue of the American Statistician, incorrectly indicated that the volume was a publication of the International Association for Research in Income and Wealth.

International Statistical Education Center, Calcutta, 1950-1951

Establishment of the Center. In view of the primary importance of statistics to national development, a program of international statistical education has been arranged by the International Statistical Institute under the auspices of, and with financial support from UNESCO. As part of this program, plans are being completed to conduct an International Statistical Education Center at Calcutta in cooperation with the Indian Statistical Institute.

Objects. The purpose of the Center is to provide courses in statistical theory and application, on an intermediate level, to a restricted number of participants from the countries of the Middle, South- and Far-East.

Qualifications. The courses in the Center will be designed for persons who are expected to become teachers of statistics in their respective countries, as well as for persons who will have practical statistical responsibilities in the programs of national development in their countries. Applicants should have a good general education, including some basic instruction in mathematics and statistics.

As the medium of instruction at the Center will be English, the participants should have a sufficient knowledge of this language to be able to take part in discussions.

Time and Duration. The first term of six months' duration will start in October, 1950. The second six-months' term will start in July, 1951. It is uncertain whether the Center will be continued after these two terms.

Participants may register for the first term, the second term, or both terms. The course given during the first term will be repeated during the second term for the newly arrived participants. More advanced courses will also be given for the participants who have already attended the first term. During the interval between the two terms, there will be an opportunity to participate in practical statistical projects carried on by the Indian Statistical Institute.

Teachers. Members of the staff of the Indian Statistical Institute will assist as required in the instruction given at the Center. Their services will be supplemented by other Indian statisticians and by lecturers from other countries, to be provided by various national and international organizations, including the United Nations and certain of its Specialized Agencies.

Curriculum. The curriculum will consist of three major elements: (a) basic courses, (b) experimental work and laboratory practice, (c) assisted reading and seminar discussions.

The basic courses may be grouped as follows (1) Statistical organization and procedures; collection and uses of data. (2) Principles of statistical methods, especially review of recent developments. (3) Non-mathematical survey of sampling theory and practice.

It may be anticipated that the previous education of the participants will vary widely. The courses will therefore be split into sections in accordance with needs.

Illustrations of the more advanced courses to be offered participants who remain for the second term are the following:

- 1) Statistical procedures in various fields; 2) Sampling methods and procedures; 3) Design of experiments; 4) Applications of statistics in industry; 5) Statistical theory.

However, the subjects and contents of these more advanced courses will be largely determined by the interests and needs of the participants.

Participants who complete the course will receive a certificate.

Expenses of Participants. Class-room, laboratory and field instruction will be provided free of charge, but participants must provide their travel and living expenses, with such financial assistance as may be needed from their governments or other sources. It has been tentatively estimated that expenses other than travel from the participants' country to and from Calcutta need not exceed, as a minimum, 200 to 250 Indian rupees per month. The Indian Statistical Institute will assist the participants in finding suitable living quarters.

Number of Participants. A strict limitation upon the number of enrolments in the Center is desired in order

to assure adequate attention to the educational needs of each individual student. Therefore, the number of participants from each country other than India and Pakistan will be limited to two during each six-month term. Decisions about the admission of candidates will be made by the Joint Board of Directors of the Center, which has been established by the International Statistical Institute and the Indian Statistical Institute, and which will be in charge of the administration of the Center. The Board of Directors has been given authority to admit more than two participants from a single country in special cases.

I. S. I. Session and Seminar. In December 1951, the Twenty-seventh Session of the International Statistical Institute will be held at Delhi at the invitation of the Indian Government. Institute Sessions have been regarded for two-thirds of a century as the highest forum for the international discussion of statistical problems of scientific and administrative importance. Following the Session will be held a "Statistical Seminar" at which some of the world's outstanding statisticians will review recent developments in statistical theory and applications in various fields. The participants in the Center will receive special invitations to attend both the Session and the Seminar.

Correspondence. Application forms, as well as any other correspondence concerning attendance at the Center should be addressed to the Honorary Administrator, Professor K. B. Madhava, International Statistical Education Center, Indian Statistical Institute, Presidency College, Calcutta 12, India.

Bulletin on Techniques of Preparing Major BLS Statistics

Descriptions of the methods by which its major statistical series are prepared have recently been issued in a concise bulletin by the U. S. Labor Department's Bureau of Labor Statistics. This is the first time that the Bureau has undertaken an over-all job of outlining methodology, although it has been customary to give details on the construction of many of these series in reports dealing with the findings themselves.

In all, 13 descriptions are included in the bulletin. They cover industrial employment; labor turn-over; earnings and hours in industry; union scales of wages and hours; occupational wages—both the sampling procedures and the conduct of surveys; strike statistics; productivity; industrial injuries; housing volume; expenditures for new construction; monthly and weekly wholesale prices; and the consumers' price index.

Copies may be obtained at a cost of 40 cents each from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Road Maps of Industry

Many secondary teachers of the social sciences and school administrators are receiving the weekly "Road Maps of Industry" regularly with the compliments of the National Industrial Conference Board, 247 Park Avenue, New York 17, N. Y.

The "Road Maps" are sent free upon written request, and are multi-colored weekly charts which deal with significant developments in the fields of business, labor, government and industrial economics. They are based on the latest statistics available from government and other accredited sources and, in each instance, source of the data upon which the chart is indicated. Each chart carries a legend with several paragraphs of explanation and frequently the supporting statistics are printed on the reverse side. The "Road Maps" measure 8½ x 11 inches, and are punched for filing in standard three-ring binders.

THE ILLINOIS STATISTICS CONFERENCE

An important shift of analytical emphasis in sampling was advocated at the Illinois Conference on "Business Applications of Statistical Sampling Methods," held at the University of Illinois' Robert Allerton Park, May 25th and 26th under the sponsorship of the College of Commerce of the University and the Chicago Chapter of the American Statistical Association, in cooperation with the American Statistical Association and its Urbana Chapter.

S. S. Wilks vigorously called into question the assumption currently made in stating probabilities that universe quantities will be within certain limits on the basis of sampling results. The assumption questioned is—"that the sampling plan was perfectly executed and that the value of the quantity in the universe would be obtained from the sample results if the size of the sample were extended so as to be identical with the universe."

This assumption is frequently invalid, he said, because of common failures to reach all respondents, the poor reliability and validity of responses and faulty analysis of the data and the drawing of unjustified conclusions from the sampling results.

The technique of breaking down the variance of the error of a percentage or an average into components—that due (a) to sheer random sampling, (b) to failure to reach all respondents, (c) to poor reliability and validity of responses and (d) faulty interpretation—was recommended.

J. Stevens Stock, speaking on "Non-sampling Errors in Sampling for Business," pointed out that no systematic treatment of the problems posed by Mr. Wilks had been attempted on any broad scale. He cited a number of cases in which variance due to interviewer error had been measured and, under strict controls and rigid probability sampling, the "interviewer error is equal to the sampling error." Under less carefully controlled conditions, as much as 95% of the error variance was due to interviewer variance, leaving but 5% to the "sheer random sampling" errors. Methods, adapted from quality control techniques to appraise and reduce interviewer variance, were explained by Mr. Stock.

The theme, "every question asked a respondent is a mathematical model," was also developed by Mr. Stock. Results of different models (different statements of the same question) were shown and the variance attributed to the model was stated to be larger than Mr. Wilks type (a) error—that due to random sampling.

William G. Madow, in discussing the "Allocation of Resources to Obtain Maximum Results from Surveys for Business," analyzed the problem of deciding how much money should be spent in reducing each of the sources of variance—sampling errors, errors of response, interviewer errors, processing errors, question errors, etc. The need for estimates of the cost of reducing variability due to each of these sources or variance was emphasized.

The first session of the Conference was devoted to the Design of Samples for Business Use. Howard Jones, dealing with the design for "within" company surveys, presented a detailed analysis of methods used

by the Illinois Bell Telephone Company in (1) sampling company records, (2) sampling physical property (in connection with rate cases) and (3) briefly, quality control.

The sample designs and the practical application of the results were developed by Mr. Jones. He also has provided appropriate mathematical formulations which will be published with the proceedings of the Conference by the University of Illinois later in the year.

Warren R. Cordell, speaking on the same program, dealt with the design for "outside" surveys. Against a background of 13 years with the A. C. Nielsen Company, Mr. Cordell gave a step by step analysis of the actual process of designing samples of various types for specific purposes. Principal emphasis was on the structure and problems in the use of large scale area samples.

Also speaking from the standpoint of sampling for market analysis W. F. O'Dell, Market Facts, Inc., analyzed the limiting factors in the research environment. Citing numerous cases to illustrate points made, Mr. O'Dell concluded with specific recommendations for improvements which are needed in his "true to life picture of the market research environment as it affects the sampler."

The sampling methods used by the Opinion Research Corporation in analyzing personnel relations, the safeguards against "non-sampling" errors and the methods used in interpreting the results were explained by Joseph R. Hochstim of that corporation. The "par for size" adjustment, scale and intensity and ingredient analysis were recommended.

E. L. Fay wrote a highly entertaining chapter on his experiences in introducing techniques of quality control in the works of Deere and Company after serving that company as an inspector and chief of inspection for some thirty years. He brought convincing evidence to his topic "Cost Savings Through Sampling Applications in Business Operations."

Luncheon speakers were R. J. Eggert, President of the Chicago Chapter of the ASA, Dean Howard R. Bowen, of the College of Commerce and Fred E. King of King-Fruen, Minneapolis, who spoke on the subject—"What the Business Executive Expects from the Statistician."

The Proceedings of the Conference will be available later in the year, through the office of Professor Earl Strong, Director, Business Management Service, 408 David Kinley Hall, University of Illinois, Urbana, Illinois.

Cooperating members of the University of Illinois faculty, in addition to Professor Madow, were Professors Dorothy Brady, Francis G. Cornell, E. J. Working and D. W. Paden. Professor W. A. Neiswanger was the conference chairman.

The Statistical Advisory Committee for the College of Commerce which cooperated in organizing the program is composed of Guenther Baumgart, Howard Jones, George Morgan, Lester Kellogg and Miss Lucile Derrick.

Lester Kellogg and Henry Arther also cooperated by serving as chairmen for sessions of the Conference.

So You're Going To Present a Paper

UNDoubtedly a big moment in any man's life is the occasion when he presents a technical paper before fellow members of his Society. Still, despite the fact that all eyes are upon him and he is the center of attraction for the moment, he must be content with second place in the matter of importance. For the audience—the men who come to hear him and to learn what he has discovered in his work—must come first. They must be given every consideration and be assisted in accomplishing just those objectives—hearing the speaker and learning from him.



NOT THIS

RELAX—Be friendly, both with your audience and the microphone, if one is provided. Statistics show not one single case of a man having been bitten by a "mike," so don't fight it. A touch of natural humor or human interest will add to your presentation. If there is no microphone, be sure to speak clearly enough so that those in the farthest seats will hear you, thus avoiding the ever-present risk of encountering one of those fellows who delight in shouting "louder," just as you think you're getting along so well.



BUT THIS

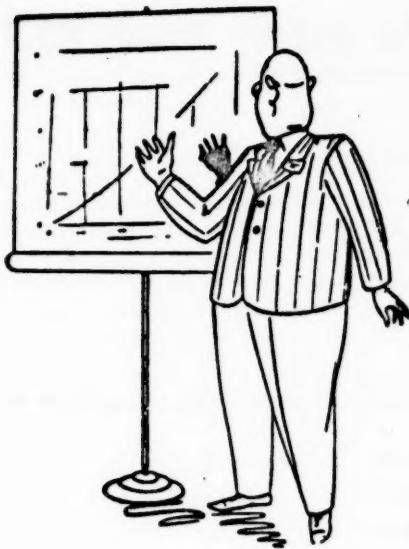
NOT THIS



FACE YOUR AUDIENCE—Look at and speak to your audience. Preliminary preparation and familiarization with your paper will enable you to look up from time to time without losing your place, thus giving your audience the impression you are as interested in it as you'd like it to be in you. This will help put across your ideas more effectively. Better yet, have your subject mastered so a few cards containing an outline will be sufficient to guide you through your presentation.

BUT THIS





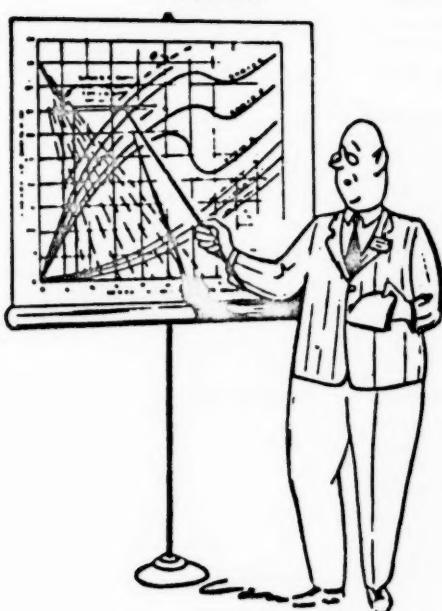
NOT THIS

TEN THOUSAND WORDS—That's the reputed equivalent of one good picture. But it's not a good picture if it requires a lengthy word-explanation. So express only one idea on a slide, and make it simple and readily understood. Make it the kind of picture you need only name, thus avoiding repetition, in describing the slide, of what you have already presented before the slide came on.



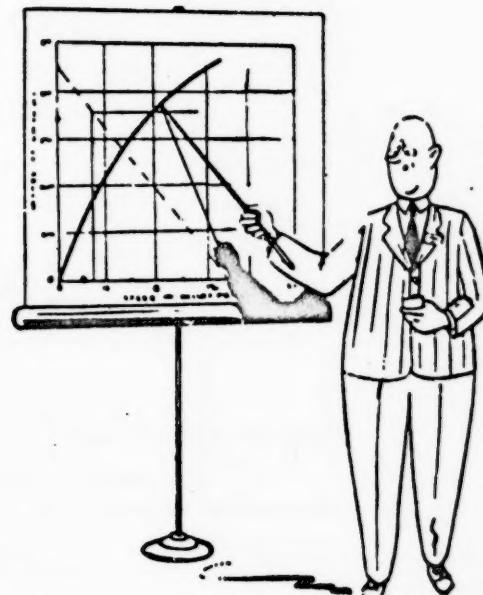
BUT THIS

LANTERN SLIDES—It's a sheer waste of your talent, and the audience's time, to address your remarks confidentially to the lantern slides. So keep facing your audience every minute of the time you're talking. If it is absolutely necessary to turn toward the screen to point to some specific item, don't try to continue your talk while doing so. One thing at a time is the best way. The time lost is measurable in seconds. The words lost by the audience can never be recaptured.



NOT THIS

BUT THIS





KEEP IT SHORT—A twenty-minute talk is better than one of half an hour's duration. The latter is about as long as you can expect to hold interest. No listener may be expected to absorb your analytical or mathematical data in one reading. Save such supporting matter for the published paper. Present orally only the significant parts, stressing what's NEW and INTERESTING in telling WHAT you did and WHY. Leave the "HOW" for the studious reader of the published paper.



NOT THIS



AND IN CONCLUSION — now we're getting somewhere. Have that conclusion ready at all times, so whether you're at a loss for words, or the chairman calls "time" on you (through no fault of yours, of course, but because other speakers have run over and thus prolonged the meeting), you can go right to your conclusion for an effective ending.



Cartoons and text reprinted by special permission of the American Society of Civil Engineers.

The Program Committee of the American Statistical Association has recently prepared a somewhat more staid booklet of advice to speakers and chairmen at its Annual Meetings. Copies may be obtained from the headquarters of the Association, 1108 Sixteenth Street, Northwest, Washington 6, D. C.

110th Annual Meeting of the AMERICAN STATISTICAL ASSOCIATION

December 27-29, 1950, Congress Hotel, Chicago, Illinois

Send all reservations directly to Daniel Amico, Congress Hotel, Chicago 5.

Among other sessions being planned is one on "Wage Statistics" to be held jointly with the Industrial Relations Research Association and one on "Current Input-Output Studies" to be held jointly with the Econometric Society. Complete programs, including all sessions, room numbers, etc., will be available for distribution at the headquarters hotel.

1950 Annual Meeting Program Committee

Mortimer Spiegelman, Chairman; Dorothy S. Brady, Gertrude M. Cox; Frank A. De Hermida, Harold F. Dorn, John W. Fertig, Harold A. Freeman, Howard Whipple Green, Kenneth W. Haemer, Philip M. Hauser, Simon Kuznets, Irving Lorge, J. E. Morton, Frederick Mosteller, Leo J. O'Grady, Paul Olmstead, Ralph J. Watkins, Alfred N. Watson, Samuel Weiss, Sylvia Weyl, Samuel S. Wilks, Holbrook Working.

WEDNESDAY—DECEMBER 27, 1950

10 A.M.-Noon

Recent Population Changes

Joining Organizations: *Population Association of America, American Public Health Association*

Chairman: Dorothy S. Thomas, University of Pennsylvania

Papers

Population Redistribution

Henry Shryock, Bureau of the Census

Fertility Trends and Differentials

Clyde V. Kiser, Milbank Memorial Fund

Mortality Trends and Differentials

I. M. Moriyama, National Office of Vital Statistics

Discussion

Everett S. Lee, Lieutenant, U. S. Army

Evelyn Kitagawa, University of Chicago

10 A.M.-Noon

Measurement of Employment and Unemployment

Business and Economics Statistics Section

Chairman: Gladys Palmer, University of Pennsylvania

Papers

Major Developments in Employment and Unemployment Statistics in Recent Decades

Kenneth B. Williams, Federal Reserve Board

Labor Force Statistics: The Task Ahead

Stanley Lebergott, U. S. Bureau of the Budget

Discussion

Cedric Wolfe, Metropolitan Life Insurance Company

10 A.M.-Noon

Statistical Problems in Radio-Biology

Biometrics Section

Joining Organizations: *Biometric Society (ENAR), Institute of Mathematical Statistics*

Chairman: A. E. Brandt, United States Atomic Energy Commission

Papers

Gene Mutations in Populations

Bruce Wallace, Long Island Biological Laboratory

Some Tracer Chemistry Experiments with Proteins

S. Lee Grunp, University of Rochester

Metabolism of Labeled Carbon Compounds

Hardin B. Jones, University of California, Berkeley

10 A.M.-Noon

Educational Test Theory

Section on the Training of Statisticians

Joining Organizations: *American Psychological Association, Psychometric Society*

Chairman: Helen M. Walker, Columbia University

Papers

History of Item Analysis in Relation to Educational and Psychological Testing

Frederick B. Davis, Hunter College

Edward E. Cureton, University of Tennessee

WEDNESDAY—DECEMBER 27, 1950

10 A.M.-Noon

Insurance Investments

Business and Economic Statistics Section

Joining Organizations: American Association of University Teachers of Insurance, American Finance Association

Chairman: James J. O'Leary, Life Insurance Association of America

Papers

Unusual Features of Life Insurance Investment

Sherwin C. Badger, New England Mutual Life Ins. Co.

The Valuation of Securities Held by Life Insurance Companies

Harold G. Fraine, University of Wisconsin

Direct Placements of Life Insurance Companies

George T. Conklin, Guardian Life Insurance Company of America

12:00-4:00 P.M.

Luncheon

Papers

The Stock Market

Business and Economics Statistics Section

Chairman: James E. Day, Midwest Stock Exchange

Observations on Security Markets and Stockholder Relations

Homer P. Hargrave, Merrill Lynch, Pierce, Fenner & Beane

Is It Possible to Forecast the Stock Market?

A. Wiltord May, Commercial and Financial Chronicle

12:00-2:00 P.M.

Luncheon

12:00-2:00 P.M.

Luncheon

2:00-4:00 P.M.

Meeting of the Outgoing Board

Business Meeting for the Section for Training of Statisticians

Chairman: J. E. Morton, Housing and Home Finance Agency

Theory of Variance Components

Biometrics Section

Joining Organizations: American Farm Economic Association, Biometric Society (ENAR), Psychometric Society, Institute of Mathematical Statistics

Chairman: W. J. Youden, National Bureau of Standards

Papers

The Present Status of Variance Component Analysis

S. Lee Crump, University of Rochester

Testing a Linear Relation Among Variances

William G. Cochran, Johns Hopkins University

Regression Problems Best Considered as Variance Components in More Dimensions

John W. Tukey, Princeton University

Discussion

A. M. Mood, Rand Corporation

D. B. DeLury, Ontario Research Foundation, Toronto

2:00-4:00 P.M.

Developments in Actuarial Science

Joining Organizations: American Association of University Teachers of Insurance, Institute of Mathematical Statistics

Chairman: Cecil J. Nesbitt, University of Michigan

Papers

Survey of Theoretical Developments

Charles A. Spoerl, Aetna Life Insurance Company

Survey of Practical Applications

E. A. Lew and Frank Week, Metropolitan Life Insurance Company

2:00-4:00 P.M.

Measurement of Group Behavior

Joining Organizations: American Psychological Association, Psychometric Society

Chairman: Harold Gulliksen, Educational Testing Service

Papers

Some Statistical Problems in Small Group Research

R. Freed Bales, Harvard University

The Relation of Microcategorizations and Ratings in the Observation of Groups

Launor F. Carter, University of Rochester

Discussion

Leo Goodman, University of Chicago

Max A. Woodbury, Princeton University

WEDNESDAY—DECEMBER 27, 1950

2:00-4:00 P.M.	Measurement of Physical Output <i>Business and Economic Statistics Section</i> <i>Joining Organization: American Economic Association</i> <i>Chairman: J. E. Morton, Housing and Home Finance Agency</i> <i>(To be announced)</i> Paper Irving H. Siegel, Johns Hopkins University
	 Discussion Solomon Fabricant, National Bureau of Economic Research Frank R. Garfield, Federal Reserve Board Martin R. Gainsbrugh, National Industrial Conference Board
2:00-4:00 P.M.	 Clinic on Presentation of Statistical Data (Participants will answer questions sent in before meeting) <i>Chairman: Kenneth W. Haemer, American Telephone & Telegraph Company</i> Participants Rudolf Modley, Executive Research, Inc. Bruce L. Jenkinson, Bureau of the Census William A. Spurr, Stanford University Also presentation salon to which people will submit samples of work
2:00-4:00 P.M.	 Statistical Control <i>Joining Organizations: Institute of Mathematical Statistics, American Society for Quality Control (Chicago Section)</i> <i>Chairman: (To be announced)</i> Speaker W. A. Shewhart, Bell Telephone Laboratories
4:00-6:00 P.M.	 Precision of Measurements <i>Biometrics Section</i> <i>Joining Organizations: American Society for Quality Control (Chicago Section), Biometric Society (ENAR), Institute of Mathematical Statistics</i> <i>Chairman: W. Edwards Deming, Division of Statistical Standards</i> Papers The Specification of Precision of Measurements Churchill Eisenhart, National Bureau of Standards The Estimation of Precision of Measurements Frank E. Grubbs, Aberdeen Proving Grounds Estimate of Precision of Textile Instruments John C. Whitwell, Princeton University H. Fairfield Smith, University of North Carolina
	 Discussion 4:00-6:00 P.M.
	 Sources of Morbidity Statistics <i>Biometrics Section</i> <i>Joining Organizations: Population Association of America, Biometric Society (ENAR), American Public Health Association</i> <i>Chairman: Harold F. Dorn, Biometrics Branch, National Institutes of Health</i> Papers Blue Cross Hospital Service as a Source of Morbidity Statistics Allen B. Thompson, Associated Hospital Service of New York Prepaid Medical Care as a Source of Morbidity Data Neva Deardorff, Health Insurance Plan of Greater New York Is the Household Survey Essential in Securing Morbidity Statistics? Theodore Woolsey and Selwyn Collins, United States Public Health Service Discussion Paul Densen, University of Pittsburgh Morton L. Levin, Commission on Chronic Illness
4:00-6:00 P.M.	 Analysis of Choices Involving Risk <i>Business and Economic Statistics Section</i> <i>Joining Organizations: American Economic Association, Econometric Society, Institute of Mathematical Statistics</i> <i>Chairman: Jacob Marschak, Cowles Commission</i> Papers Alternative Approaches to Theory of Choice in Risk-Taking Situations Kenneth J. Arrow, Stanford University An Experimental Measurement of Utility Frederick Mosteller, Harvard University Discussion Armen Alchian, University of California Milton Friedman, University of Chicago Franco Modigliani, University of Illinois

WEDNESDAY—DECEMBER 27, 1950

4:00-6:00 P.M.	Mid-Century Review and Outlook for Price Information <i>Business and Economic Statistics Section</i> <i>Chairman: Lester S. Kellogg, Deere & Co.</i>
Papers	The Nature of Price Information Which Will be Needed for the Next Half-Century R. D. Hellebower, Northwestern University
	Statistical Problems Involved in the Development of Needed Price Information W. A. Neiswanger, University of Illinois
4:00-6:00 P.M.	Multivariate Analysis <i>Joining Organizations: Institute of Mathematical Statistics, Econometric Society</i> <i>Chairman: (To be announced)</i> Speaker Harold Hotelling, University of North Carolina

8:00 P.M. **Informal Party, sponsored by the Chicago Chapter**
Members of the ASA and other participating Societies and their families are invited.
Tickets may be purchased at the Registration Desk

THURSDAY—DECEMBER 28, 1950

8:00-10:00 A.M.	Chapter and District Representatives Meeting
9:00-10:00 A.M.	Business Meeting of the Biometrics Section <i>Chairman: Harold Dorn, Biometrics Branch, National Institutes of Health</i>
10 A.M.-Noon	Measurement of National Income <i>Business and Economic Statistics Section</i> <i>Joining Organization: American Economic Association</i> <i>Chairman: Martin Gainsbrugh, National Industrial Conference Board</i>
Papers	National Income Analysis—Present Status and Remaining Problems Henry H. Villard, City College of New York
	Managerial Use of National Income Accounting Wilson Wright, Procter & Gamble Company
	National Income—Problems and Plans of the Emanating Agency George Jaszi, U. S. Department of Commerce
10:00 A.M.-Noon	Engineering, First Session <i>Joining Organizations: American Society for Quality Control (Chicago Section), Institute of Mathematical Statistics</i> <i>Chairman: Frederick J. Halton, Jr., Deere & Co.</i>
Paper	Statistics in Production and Inspection Edwin G. Olds, Carnegie Institute of Technology
Discussion	Warren E. Jones, Desplaines, Illinois Charles A. Bicking, Hercules Powder Co.
10 A.M.-Noon	Statistical Literacy in the Social Sciences <i>Section on the Training of Statisticians</i> <i>Joining Organizations: American Psychological Association, Psychometric Society, Institute of Mathematical Statistics</i> <i>Chairman: Philip M. Hauser, University of Chicago</i> Helen M. Walker, Columbia University
Speaker	Statistical Methods in Pharmacology and Immunology
10 A.M.-Noon	Biometrics Section <i>Joining Organizations: Biometric Society (ENAR), Institute of Mathematical Statistics</i> <i>Chairman: Lloyd Miller, Sterling-Winthrop Research Institute</i>
Papers	Collaborative Bio-assays Lila F. Knudsen, Federal Security Agency
Discussion	Statistical Methods in Immunology Herbert C. Batson, Army Medical Center Joseph Berkson, Mayo Clinic

THURSDAY—DECEMBER 28, 1950

10:00 A.M.-Noon	Non-Parametric Inference <i>Joining Organization: Institute of Mathematical Statistics</i> <i>Chairman: (To be announced)</i> Speaker A. M. Mood, Rand Corporation
12:00-4:00 P.M. Luncheon	Outlook for 1951: Implications of the Defense Program for Finance and Industry <i>Business and Economic Statistics Section</i> <i>Chairman: Robert W. Burgess, Western Electric Company</i> Speakers Donald B. Woodward, Mutual Life Ins. Co. of New York Alan H. Temple, National City Bank of New York <i>Discussion from the floor</i>
2:00-4:00 P.M.	Developments in U. S. Census Taking <i>Joining Organizations: Population Association of America, Institute of Mathematical Statistics</i> <i>Chairman: W. F. Ogburn, University of Chicago</i> Papers Role of Research in Census Taking Morris Hansen, Bureau of the Census Evaluation of Census Results Eli Marks, Bureau of the Census Census Programs and Operations A. Ross Eckler, Bureau of the Census
Discussion	Nathan Keyfitz, Dominion Bureau of Statistics, Ottawa Virgil D. Reed, J. Walter Thompson Co.
2:00-4:00 P.M.	Statistical Problems and Psychological Theory <i>Joining Organizations: American Psychological Association, Psychometric Society, Institute of Mathematical Statistics</i> <i>Chairman: Adam R. Gilliland, Northwestern University</i> Papers Statistical Problems and Psychological Scaling Clyde H. Coombs, University of Michigan Statistical Problems and Learning Theory Kenneth W. Spence, State University of Iowa Statistical Problems and Social Interaction Theory Leon Festinger, University of Michigan
Discussion	Harold P. Bechtoldt, Iowa City Harold Gulliksen, Educational Testing Service Joseph Zubin, New York State Psychiatric Institute
2:00-4:00 P.M.	Applications of Variance Components <i>Biometrics Section</i> <i>Joining Organizations: Biometric Society (ENAR), Institute of Mathematical Statistics</i> <i>Chairman: G. W. Snedecor, Iowa State College</i> Papers Variance Components as a Tool for the Analysis of Sample Data Walter A. Hendricks, U. S. Department of Agriculture Consistency of Estimates of Variance Components R. E. Comstock and H. F. Robinson, North Carolina State College Use of Components of Variance in Preparing Schedules for the Sampling of Baled Wool J. Cameron, National Bureau of Standards Discussion Walter T. Federer, Cornell University
2:00-4:00 P.M.	Engineering, Second Session <i>Joining Organizations: American Society for Quality Control (Chicago Section), Institute of Mathematical Statistics</i> <i>Chairman: W. Edwards Deming, Division of Statistical Standards</i> Papers Statistics in Engineering Research and Development Ellis R. Ott, Rutgers University Statistical Developments in South Africa H. S. Sichel, Educational Testing Service

THURSDAY—DECEMBER 28, 1950

2:00-4:00 P.M.	Some Recent Advances in the Theory of Decision Functions <i>Joining Organizations: Institute of Mathematical Statistics, Econometric Society</i> <i>Chairman: (To be announced)</i> Speaker Jacob Wolfowitz, Columbia University
4:00-6:00 P.M.	Measurement of Productivity <i>Business and Economic Statistics Section</i> <i>Chairman: Hiram S. Davis, University of Pennsylvania</i> Papers A Half Century of American Productivity Measurement Irving H. Siegel, Johns Hopkins University On the Usefulness of Productivity Measures Peter Steiner, University of California
4:00-6:00 P.M.	Statistical Inference <i>Section on the Training of Statisticians</i> <i>Joining Organizations: Psychometric Society, Institute of Mathematical Statistics, Econometric Society</i> <i>Chairman: (To be announced)</i> Speaker J. Neyman, University of California
4:00-6:00 P.M.	Sample Survey Techniques <i>Biometrics Section, Business and Economic Statistics Section</i> <i>Joining Organizations: American Farm Economic Association, Biometric Society (ENAR), Institute of Mathematical Statistics</i> <i>Chairman: W. F. Callander, Gainesville, Fla.</i> Papers A Consumer Survey Arnold J. King, National Analysts, Inc., Philadelphia Approaches to Agricultural Price Statistics F. E. McVay and Henry Tucker, North Carolina State College Problems in Rural Surveys R. L. Anderson and A. L. Finkner, North Carolina State College B. R. Stauber, Division of Agricultural Price Statistics
Discussion	Engineering, Third Session <i>Joining Organization: American Society for Quality Control (Chicago Section)</i> <i>Chairman: H. H. Morgan, Robert W. Hunt Co., Chicago</i> Paper Legal Aspects of a Standard of Quality Frank R. Kennedy, State University of Iowa
4:00-6:00 P.M.	Discussion <i>Lila F. Knudsen, Federal Security Agency</i> Round Table: What Can High Speed Electronic Computing Equipment Do For and To Statistics? <i>Joining Organizations: Psychometric Society, Institute of Mathematical Statistics</i> <i>Moderator: William G. Madow, University of Illinois</i> <i>Electronic Engineer: Sam N. Alexander, National Bureau of Standards</i> <i>Expert User: Byron Schreiner, A. C. Nielsen Company, Chicago</i> Discussion Howard C. Grieves, Bureau of the Census John J. Finelli, Metropolitan Life Insurance Company
4:00-6:00 P.M.	Housing Statistics <i>Business and Economic Statistics Section</i> <i>Joining Organization: American Economic Association</i> <i>Chairman: (To be announced)</i> Papers The Supply of Housing Leo Grebler, Columbia University Effects of Rents and Rent Ceilings on the Distribution of Income Gale Johnson, University of Chicago

8:00-10:00 P.M. Annual Business Meeting and Presidential Address

FRIDAY, DECEMBER 29, 1950

9:00-10:00 A.M. **Business Meeting of the Business and Economic Statistics Section**

9:30-Noon **Economic Theory, Statistics, and Economic Practice**
Business and Economic Statistics Section
Joining Organizations: American Economic Association, The Econometric Society
Chairman: (To be announced)
Papers (To be announced)
Frank Boddy, University of Minnesota
Rutledge Vining, University of Virginia

10 A.M.-Noon **General Review of Economic Statistics in Agriculture**

Business and Economic Statistics Section
Joining Organization: American Farm Economic Association
Chairman: Warren C. Waite, University Farm, St. Paul, Minn.

Papers The Nature of Agricultural Data and the Systems Which Supply Them
S. R. Newell, U. S. Department of Agriculture
Developments in Agricultural Statistics in the Bureau of the Census
Ray Hurley, Bureau of the Census

Discussion T. W. Schultz, University of Chicago

10 A.M.-Noon **Statistical Measures of Concentration in Business**

Business and Economic Statistics Section
Joining Organization: American Economic Association
Chairman: A. D. H. Kaplan, Brookings Institution

Papers Criteria and Statistical Approaches
Charles F. Roos, Econometric Institute
Aggregate Measures and Their Alternatives
Alfred S. Cleveland, University of California
Requirements for Economic Analysis and Public Policy
John M. Blair, Federal Trade Commission

Discussion Harold T. Davis, Northwestern University
George J. Stigler, Columbia University
Gardiner C. Means, Committee for Economic Development

10:00 A.M.-Noon **Factor Analysis as a Statistical Tool**

Joining Organizations: Psychometric Society, American Psychological Association, Institute of Mathematical Statistics
Chairman: Herbert Woodrow, University of Illinois

Speaker L. L. Thurstone, University of Chicago
Discussion Edward E. Cureton, University of Tennessee
R. J. Wherry, Columbus, Ohio

10:00 A.M.-Noon **Statistics in the Physical Sciences**

Joining Organizations: American Society for Quality Control (Chicago Section), Institute of Mathematical Statistics
Chairman: Samuel S. Wilks, Princeton University

Speaker Walter Bartky, University of Chicago
Discussion J. L. Doob, University of Illinois

FRIDAY, DECEMBER 29, 1950

10:00 A.M.-Noon

Statistical Methods in Medicine

Biometrics Section

Joining Organizations: Biometric Society (ENAR), Institute of Mathematical Statistics, American Public Health Association

Chairman: Hugo Muench, Harvard University

Papers

Survival Curves for Special Diseases

Joseph Berkson, Mayo Clinic

The Design of Physiological and Clinical Investigation

Donald Mainland, New York University and J. W. Hopkins, National Research Council, Ottawa

Multivariate Analysis in Medical Research

James A. Rafferty, School of Aviation Medicine, Texas

10:00 A.M.-Noon

Development of Population Statistics for Policy Determination

Joining Organization: Population Association of America

Chairman: Philip M. Hauser, University of Chicago

Papers

Population Statistics in Relation to Development of Underdeveloped Areas

P. K. Whelpton, Miami University, Ohio

Population Statistics in Relation to Population Policy

Frank W. Notestein, Princeton University

Discussion

Frank Lorimer, American University

Wilbert C. Moore, Princeton University

10:00 A.M.-Noon

Surveys

Joining Organization: Institute of Mathematical Statistics

Chairman: (To be announced)

Speaker

William G. Madow, University of Illinois

12:00-4:00 P.M.

Luncheon

Papers

Committee on Census Enumeration Areas

Chairman: Howard Whipple Green, Cleveland Health Council

The Marketer's Interest in Census Tract Data

Ross M. Cunningham, Massachusetts Institute of Technology

What We Expect of Local Census Tract Committees

Roy V. Peel, Bureau of the Census

Presentation of Population and Housing Data by Census Tracts

Howard G. Brunsman, Bureau of the Census

Problems Arising in Connection with Census Tract Boundaries

C. E. Batschelet, Bureau of the Census

Combining Census Tracts to Make Up Retail Trade Areas

Harvey Kailan, Bureau of the Census

New Census Tract Cities in Canada

O. A. Lemieux, Dominion Bureau of Statistics

Welcome to Key Persons Representing New Census Tract Cities

Howard Whipple Green

Five-Minute Reports by Various Census Tract Key Persons

General Discussion

2:00-4:00 P.M.

Progress in the Analysis of Demand

Business and Economic Statistics Section

Joining Organizations: Econometric Society, American Economic Association

Chairman: Frederick V. Waugh, Council of Economic Advisers

Papers

The Relation of Income to Expenditures

Dorothy S. Brady, University of Illinois

Relations between Prices, Consumption, and Production

Karl Fox, Bureau of Agricultural Economics

The Demand for Installment Credit

Avram Kisselgoff, National Bureau of Economic Research

Discussion

Holbrook Working, Stanford University

Jacob Marschak, Cowles Commission, Chicago

FRIDAY, DECEMBER 29, 1950

2:00-4:00 P.M.	Training of Interviewers <i>Section on the Training of Statisticians</i> <i>Chairman: Angus Campbell, University of Michigan</i>
Papers	(To be announced) Elmo Roper, New York City Jack B. Robertson, Bureau of the Census Charles F. Cannell, University of Michigan
Discussion	J. Stevens Stock, Department of Labor Valter V. Monroe, National Analysts, Inc., Philadelphia
2:00-4:00 P.M.	Developments in World Census Taking <i>Joining Organizations: Population Association of America, American Farm Economic Association</i> <i>Chairman: Stuart A. Rice, Division of Statistical Standards</i>
Papers	Censuses in the Western Hemisphere Calvert Dedrick, Bureau of the Census Censuses in the Eastern Hemisphere Forrest E. Linder and C. K. Dilwali, UN Statistical Office World Census of Agriculture Conrad Taeuber, Food and Agriculture Organization
2:00-4:00 P.M.	Uses of Sampling Procedures in Social Security <i>Chairman: Robert J. Myers, Social Security Administration</i>
Papers	Sampling Problems and Methods in Unemployment Insurance Elizabeth J. Slotkin, Department of Labor Sampling in Old-Age and Survivors Insurance Statistical Program Benjamin J. Mandel, Bureau of Old-Age and Survivors Insurance Applications of Sampling Techniques in Public Assistance Research Walter Perkins, Social Security Administration
Discussion	Jack Elkins, Railroad Retirement Board Jerome Cornfield, National Institutes of Health
2:00-4:00 P.M.	Statistical Measurement in Economic Mobilization Planning <i>Business and Economic Statistics Section</i> <i>Chairman: Isador Lubin, Confidential Reports</i>
Papers	Statistical Measurement and Economic Mobilization Planning Glenn E. McLaughlin, National Security Resources Board The Problem of Measuring Industrial Capacity William H. Shaw, Office of Program Planning The Application of the Input-Output Technique to the Analysis of Air Force Requirements and Operations Marshall K. Wood, Department of the Air Forces
4:00-6:00 P.M.	Agricultural Commodity Production and Marketing Statistics <i>Business and Economic Statistics Section</i> <i>Joining Organization: American Farm Economic Association</i> <i>Chairman: Holbrook Working, Stanford University</i>
Papers	Measuring Magnitudes and Trends in the Production of Livestock and Meat A. V. Nordquist, Department of Agriculture Statistics in the Meat Packing Industry R. J. Eggert, American Meat Institute
Discussion	L. J. Norton, University of Illinois

FRIDAY, DECEMBER 29, 1950

4:00-6:00 P.M.	<p>Reorganization of United States Statistics on Shipping and Foreign Trade</p> <p><i>Business and Economic Statistics Section</i></p> <p><i>Chairman: Donald C. Riley, Division of Statistical Standards</i></p>
Papers	<p>Integration of the Shipping and Foreign Trade Statistics of United States Government Agencies</p> <p>J. A. Lynn, Division of Statistican Standards</p> <p>Adapting Foreign Trade Statistics to Changing Needs</p> <p>J. Edward Ely, Bureau of the Census</p> <p>Statistics in Relation to Maritime Problems</p> <p>William B. Harmon, Maritime Administration</p> <p>Usual and Unusual Applications of Waterway Statistics</p> <p>W. A. C. Connelly, Department of the Army</p>
Discussion	<p>Theodore J. Kreps, Joint Committee on the Economic Report</p> <p>David L. Glickman, Port of New York Authority</p>
4:00-6:00 P.M.	<p>R. A. Fisher Survey</p> <p><i>Section on the Training of Statisticians</i></p> <p><i>Joining Organization: Institute of Mathematical Statistics</i></p> <p><i>Chairman: Gertrude Cox, University of North Carolina</i></p>
Papers	<p>(To be announced)</p> <p>W. J. Youden, National Bureau of Standards</p> <p>Harold Hotelling, University of North Carolina</p>
4:00-6:00 P.M.	<p>Statistics in the Social and Welfare Services</p> <p><i>Chairman: Edward T. Frankel, Health and Welfare Federation of Allegheny County</i></p>
Papers	<p>Statistical Series of Volume of Services and Expenditures of Social Service Agencies</p> <p>Ralph G. Hurlin, Russell Sage Foundation</p> <p>Measurement of Relative Needs of Geographic Units for Social Services</p> <p>Bertram J. Black, Jewish Board of Guardians</p> <p>Some Uses of Statistical Techniques in Planning Health and Welfare Programs</p> <p>Edward B. Olds, Social Planning Council, St. Louis</p>
Discussion	<p>Esther Moore, Community Chests and Councils of America</p> <p>Ellery F. Reed, Community Chest of Cincinnati & Hamilton County</p> <p>Lillian Ripple, Welfare Council of Metropolitan Chicago</p>
4:00-6:00 P.M.	<p>Measurement of Opinion</p> <p><i>Business and Economic Statistics Section</i></p> <p><i>Joining Organizations: American Marketing Association, American Psychological Association, Psychometric Society, Institute of Mathematical Statistics</i></p> <p><i>Chairman: Samuel A. Stouffer, Harvard University</i></p>
Papers	<p>A New Approach to Thurstone's Method of Scaling</p> <p>Frederick Mosteller, Harvard University</p> <p>A Critical Analysis of Guttman's Theory of Principal Components in Attitude Measurement</p> <p>Philip J. McCarthy, Cornell University</p> <p>Implications for Factor Analysis of Lazarsfeld's Latent Structure Theory</p> <p>Bert J. Green, Princeton University</p>
Discussion	<p>Paul F. Lazarsfeld, Columbia University</p>
6:00-8:00 P.M.	<p>Meeting of the Incoming Board and Council</p>
	<p>Dinner</p>

Statistics for Engineers at Purdue

IRVING W. BURR

Prof. of Mathematics, Research Assoc.,

Statistical Laboratory, Purdue University

At Purdue University, statistical course work designed primarily for engineers began in 1942, as a result of a request from the Highway Research department. The first course has continuously evolved since then, and last year was taken by about 300 students, mostly juniors, seniors and graduates in engineering. In the spring of 1948 a second course was added to the curriculum, the enrolment of which has grown from twenty to forty in two years.

The main emphasis in both of these courses is on interpretation and application of statistical methods rather than on derivations. Some proofs are given, however, since we can and do assume calculus as a prerequisite. Insofar as possible, problem material is on actual industrial and engineering research data, to aid in motivation, to show the wide applicability of the methods, and to give the student some practice in taking hold of practical engineering problems without too specific instructions.

In the first course (three credit hours, 17-week semester), E. L. Grant's *Statistical Quality Control* McGraw-Hill, has recently been used as the main text. The topics are frequency tabulation, averages (mostly mean) and variability, use of calculating machine, normal curve, control charts for measurements and attributes, simple probability, statistics of combinations, acceptance sampling for both attributes and variables, some linear correlation and material on how statistics fits into an organization. The second course has H. A. Freeman's *Industrial Statistics*, Wiley and Sons, as a required reference. Most of the course, however, is built around mimeographed outlines and problems. Topics included are curve-fitting, linear and multiple correlation, sample vs. population, significant differences between two samples, confidence limits, analysis of variance (through factorial designs and including Bartlett's test on variability), the Joint

Army-Navy acceptance sampling tables in relation to Army Ordnance and Dodge, Romig tables, sequential analysis for attributes and measurements, frequency functions (Pearson Type III, hypergeometric, binomial and Poisson), chi-square tests. In both courses class experiments play an active part in illustrating the theory, since they are convincing to the student and give him valuable aids in working with associates who may be untrained statistically. Efficient use of calculating machines is also stressed. Field trips to plants using statistical quality control are stimulating to the class.

Many graduate engineers take both courses as a minor for a master's degree program, while quite a few take not only the two engineering statistics courses, but also two mathematical statistics courses. It is easy to place in good quality control positions engineers who have had either the two or four course programs. In fact, owing to the newness of the field and its rapid expansion, a single course may suffice to place the student in an organization where he will be doing quality control work.

Paralleling the work for regular engineering students, Purdue has also run two elementary intensive courses in statistical quality control, for industrial personnel. An advanced intensive course in statistical quality control was developed by the writer and first given in 1947, being run each summer since then. The subject matter of these courses rather closely parallels the previously given outlines of the credit courses, but naturally the material must be presented at a less sophisticated mathematical level. A total of 180 industrial people have attended the latter course in its four editions.

No bibliography is here included, for brevity's sake. One may be obtained by writing the author.

... make your reservations early . . .
write Daniel Amico, Congress Hotel, Chicago 5, Illinois

110th Annual Meeting of the AMERICAN STATISTICAL ASSOCIATION

December 27-29, 1950

CONGRESS HOTEL

Chicago, Illinois

The Effects of Calendar Shifts on Series of Monthly Data

by CHARLES E. ARMSTRONG

American Telephone and Telegraph Company

This is the first of two articles

The Problem

For use in studying past performance and current trends, and particularly in making short-term forecasts, the smoothing of time series is an important step. To the extent possible, it is desirable to remove month-to-month fluctuations in such a way that they may be predicted and superimposed on the projection of the smoothed data. Usually, seasonal variation is the largest element which may be handled in this manner. In some series, however, the effects of shifts in our calendar from one year to another are appreciable and may be susceptible to measurement and prediction.

In series of monthly data in which the contributions of Saturdays and Sundays to the monthly totals are different from those of week-days, variations in the number of Saturdays or Sundays in a month produce corresponding fluctuations in the monthly data. Since our calendar shifts two days in leap years and one day in all other years, the number of Saturdays in any given month usually changes from one year to the next. For example, January had 4 Saturdays and 4 Sundays in 1947, 5 Saturdays and 4 Sundays in 1948, 5 Saturdays and 5 Sundays in 1949, and 4 Saturdays and 5 Sundays in 1950. The study of the effects of such calendar shifts, although allied to the study of seasonal variation, is a separate field requiring special techniques.

Its Importance

In cases in which the relative values of Saturdays and Sundays depart radically from those of week-days, calendar shift effects can become quite troublesome. Consider the extreme example in which neither Saturdays nor Sundays make any contribution to the monthly totals, i.e., they each have zero equivalent value as compared with week-days. Under such conditions, a 30-day month with 5 Saturdays and 5 Sundays would contain 20 equivalent week-days, and one with 4 Saturdays and 4 Sundays would include 22 equivalent days, or an increase of 10%. This is, of course, an extreme case, but it points up the importance this factor can assume. And, in practice, it is not uncommon to find series in which the calendar shift effects may produce fluctuations of 5% to 8%. This is particularly true in series composed largely of weekly payrolls.*

Standard Methods

In such simple cases as the illustration just cited, the usual solution to the problem is to put the series on a per-week-day basis. The number of week-days in each month may be determined from a perpetual

calendar, and the monthly data divided by this series. A similar approach may also be used when either Saturday or Sunday has zero value, and the other of the two a full week-day value. When, however, either or both of the week-end-days have fractional values, the process becomes somewhat more complex. In such cases, the week-end days may be added, at their equivalent values, to the number of week-days in the month, resulting in an equivalent number of week-days in each month. For example, if Saturday is equal to 0.7 of a week-day, and Sunday equals 0.3, a 4-Saturday, 5-Sunday January would contain $4 \times 0.7 + 5 \times 0.3 + 22 = 26.3$ equivalent week-days. Dividing the January total by this figure would put the data on an equivalent day basis, and repeating the procedure for all months covered would eliminate the effects of calendar shift. If it is desired to put the series back on a monthly basis, this can be done by multiplying the equivalent day series by the average number of equivalent days in each of the twelve months. This would result in the data being stated in monthly terms, but assuming each month contained an average number of Saturdays and Sundays.

A System of Identification

A calendar month must have 4 Saturdays and 4 Sundays, 5 Saturdays and 4 Sundays, 4 Saturdays and 5 Sundays or 5 Saturdays and 5 Sundays. We may identify all 4-Saturday, 4-Sunday months as a-months, all 5-Saturday, 4-Sunday months as b-months, all 4-Saturday, 5-Sunday months as c-months, and all 5-Saturday, 5-Sunday months as d-months. There are, of course, 28-, 29-, 30-, and 31-day months, but each of these always occurs in the same calendar month every year, and most of the fluctuations arising out of overall length of month variations will be removed by the application of seasonal variation adjustments.

Calendar Shift Indexes

The process of computing the number of equivalent days in each month, putting the original series on a per-equivalent-day basis, and then reconverting to a monthly basis is a laborious job. This chain of computations can be condensed into a single operation, the application of an index similar to an index of seasonal variation, which reflects the amount by which the month in question differs from an average month by reason of the non-average number of Saturdays and Sundays it contains.

* Series composed largely of weekly payrolls, in industries or sections operating on a 5-day week will have Saturday and Sunday values near zero. Series, such as retail sales in agricultural areas, may show Saturday values higher than a week day.

This index may be derived from the following formulae:

$$\text{Index for an a-month} = a \\ = 100 \frac{4 \text{ Sa} + 4 \text{ Su} + 22.66}{4.38 \text{ Sa} + 4.38 \text{ Su} + 21.90}$$

$$\text{Index for a b-month} = b \\ = 100 \frac{5 \text{ Sa} + 4 \text{ Su} + 21.66}{4.38 \text{ Sa} + 4.38 \text{ Su} + 21.90}$$

$$\text{Index for a c-month} = c \\ = 100 \frac{4 \text{ Sa} + 5 \text{ Su} + 21.66}{4.38 \text{ Sa} + 4.38 \text{ Su} + 21.90}$$

$$\text{Index for a d-month} = d \\ = 100 \frac{5 \text{ Sa} + 5 \text{ Su} + 20.66}{4.38 \text{ Sa} + 4.38 \text{ Su} + 21.90}$$

In these formulae Sa represents the proportionate part of a week-day represented by a Saturday, and Su the proportionate part represented by a Sunday. They give a, b, c and d-indexes of calendar shift which apply to all months except February. Since February has 28 days in some years, and 29 in other years, special steps are necessary to recognize this peculiarity.

All non-leap-year basic indexes of calendar shift are 99.12. After the a-, b-, c- and d-indexes for the non-February months have been computed by means of the above formulae, the leap-year basic February indexes may be derived as follows:

$$\begin{aligned} \text{Leap-year "a" Index} &= 102.65 + 0.155 \text{ (a-d)} \\ \text{Leap-year "b" Index} &= 102.65 + 0.155 \text{ (a-d)} - 1.085 \text{ (a-b)} \\ \text{Leap-year "c" Index} &= 102.65 + 0.155 \text{ (a-d)} - 1.085 \text{ (a-c)} \end{aligned}$$

CALENDAR SHIFT INDEXES FOR VARIOUS RELATIVE VALUES OF SATURDAY & SUNDAY

Percent of Weekday		Indexes for all Non-February Months					Basic Indexes for Leap-Year Februarys*		
Saturday	Sunday	a	b	c	d	a	b	c	
100	100	100.00	100.00	100.00	100.00	102.65+	102.65+	102.65+	
100	80	100.25+	100.25+	99.58	99.58	102.75	102.75	102.02	
100	60	100.53	100.53	99.14	99.14	102.87	102.87	101.36	
100	50	100.67	100.67	98.91	98.91	102.92	102.92	101.01	
100	40	100.81	100.81	98.67	98.67	102.98	102.98	100.66	
100	20	101.12	101.12	98.17	98.17	103.11	103.11	99.91	
100	0	101.45-	101.45-	97.64	97.64	103.24	103.24	99.12	
80	80	100.53	99.83	99.83	99.14	102.87	102.11	102.11	
80	60	100.81	100.10	99.39	98.67	102.98	102.21	101.44	
80	50	100.96	100.24	99.15+	98.43	103.04	102.26	101.08	
80	40	101.12	100.38	98.91	98.17	103.11	102.31	100.71	
80	20	101.45-	100.68	98.40	97.64	103.24	102.40	99.93	
80	0	101.79	101.01	97.86	97.07	103.38	102.53	99.12	
60	60	101.12	99.65-	99.65-	98.17	103.11	101.52	101.52	
60	50	101.28	99.78	99.41	97.91	103.17	101.54	101.14	
60	40	101.45-	99.92	99.16	97.64	103.24	101.58	100.76	
60	20	101.79	100.22	98.65-	97.07	103.38	101.68	99.97	
60	0	102.17	100.54	98.09	96.46	103.54	101.77	99.12	
50	50	101.45-	99.54	99.54	97.64	103.24	101.17	101.17	
50	40	101.62	99.68	99.30	97.36	103.31	101.21	100.79	
50	20	101.98	99.98	98.77	96.77	103.46	101.29	99.98	
50	0	102.37	100.29	98.22	96.14	103.62	101.36	99.12	
40	40	101.79	99.43	99.43	97.07	103.38	100.82	100.82	
40	20	102.17	99.72	98.91	96.46	103.54	100.88	100.00	
40	0	102.57	100.03	98.34	95.81	103.70	100.24	99.12	
20	20	102.57	99.19	99.19	95.81-	103.70	100.03	100.03	
20	0	103.00	99.49	98.61	95.10	103.87	100.06	99.12	
0	0	103.47	98.90	98.90	94.34	104.07	99.12	99.12	
Saturday		a	b	c	d	a	b	c	
		READ UP							

* All non-leap-year February indexes are 99.12.

Dividing the data by the above-derived indexes places the original monthly data on an equated monthly basis, which assumes all 31-day months contain $31/7=4.43$ equivalent weeks, and all 30-day months contain $30/7=4.29$ equivalent weeks. The adjustment for the overall length of the month is left to the seasonal variation process, which also includes allowances for holidays and other seasonal influences. In the case of February, the application of the calendar shift index puts February on an average 28.25-day basis. Thus, in all cases the index is designed to adjust for fluctuations resulting from the shifts in our calendar from one year to the next, and makes no attempt to intrude on the territory of seasonal variation.

For any given set of values of Saturdays and Sundays there are only 7 possible calendar shift indexes. In order further to systematize the process and reduce clerical labor, Table I has been prepared, which shows, for various combinations of whole and fractional values of Saturdays and Sundays, the calendar shift indexes computed from these formulae. For fractional values not shown, simple interpolation should in most cases prove satisfactory, or the indexes may be worked out using the formulae.

Measuring Calendar Shift Effects in a Series

A method for measuring the probable values of Saturdays and Sundays directly from consideration of the monthly data will be discussed in a later article.

The International Technical Cooperation Program of the Bureau of Labor Statistics — 1945-50

by THOMAS F. MOSIMANN
Bureau of Labor Statistics

The international technical cooperation program of the U. S. Labor Department's Bureau of Labor Statistics was inaugurated to meet the needs of countries wishing assistance in initiating the collection and analysis of labor statistics, or in expanding and improving existing statistical series in this field.

During and since World War II there has been an increasing awareness of the need of adequate labor statistics in planning for and evaluating economic progress. Labor statistics are needed for estimating manpower potential in relation to proposed development projects, conditions of work, wage-price relationships, and consumption levels. As the program has developed, it has also been concerned with projects for promoting greater comparability among labor statistics series between countries. It has served to bring together for longer or shorter periods, labor statisticians from more than 40 countries, and has provided valuable opportunities for exchange of information about technical problems and different ways of meeting them, possibilities for development in situations of different types, and future needs. Something has been accomplished, but it is clear that much remains to be done. The Point IV program will make it possible for statisticians from the underdeveloped countries to study the techniques used in the Bureau of Labor Statistics, and, at their request, for the Bureau's staff to work with them on possible adaptations of these techniques to conditions in their own countries. There is also a need for cooperating in programs with countries already having well developed labor statistics and with the International Labor Office and the United Nations Statistical Office in the promotion of comparability in labor statistics. In these programs, experience so far shows that the Bureau's staff have much to gain as well as to give in the cooperative program.

History

Over the years the BLS has cooperated informally with labor statisticians from other countries, and has participated in the international labor statistics conferences of the ILO. Its formal program for technical cooperation with statistical agencies of other nations began in 1945, when Mr. S. W. Wilcox, at that time Chief Statistician of the Bureau, was given extended

leave of absence to serve as Director of the Bureau of Statistics and Census of Panama. He served in this capacity until his return to the Bureau of Labor Statistics in 1947.

In 1946 in accordance with the "Act to authorize the President to render closer and more effective relationships between the American Republics" (Public Law 335, 76th Congress), the Bureau formulated a program to award grants to Latin-American Government statisticians to study in the United States and designated a staff to direct their training. Applicants for awards have been chosen each year from qualified statisticians submitting applications through the United States Embassies in their own countries.

A predominant interest of labor statisticians in Latin-America during the past 5 years has been the development of plans for the 1950 Census of the Americas. The Bureau of Labor Statistics has stressed, in its training program, the importance of the labor statistics aspects of Census work. The BLS has planned its training program in close cooperation with the Bureau of the Census, the Bureau of Agricultural Economics, the National Office of Vital Statistics, and more recently, with the Office of Business Economics. These agencies have worked together and with the Inter-American Statistical Institute in choosing candidates for awards and many BLS students have been enrolled in Bureau of the Census classes as an important part of their training. BLS staff members have cooperated in conducting courses in Census training programs.

Direct consultation with other countries has been particularly important since the spring of 1949. At that time BLS staff members began to serve as statistical advisors at the request of the Government of Costa Rica in a study of family expenditures aimed at the revision of the cost-of-living index for the capital, San Jose. Such consultation now forms an important part of the Bureau's program. Consultative services in connection with the development or revision of cost-of-living indexes have been in demand and BLS staff members are currently acting as advisors in this field to official statistical agencies in Ecuador and Chile. Lectures on the subject have been delivered in Guatemala and Mexico. The assignment of consultants is conditional upon a formal request from the country through diplomatic channels.

Cooperation with Other Agencies

Members of the international statistical staff have cooperated with other United States and international agencies on statistical projects and have conducted courses in statistics in Census training institutes in Mexico and Washington. They represented the Bureau at the second and third conferences of the Committee on the 1950 Census of the Americas of the Inter-American Statistical Institute held in Rio de Janeiro, Brazil, and Bogota, Colombia, in 1949 and 1950, respectively. Staff members have collaborated with the Bureau of the Census and the Inter-American Statistical Institute in preparing an occupational classification for use in the Latin-American censuses of 1950. They have also assisted the Commissioner of Labor Statistics in working with staff members of ILO and of the UN Statistical and Population Commissions on the problem of the inter-relationship of classifications of the labor force by occupation, industry, and class of worker.

Training Programs in Washington

The subjects covered in the training programs of the visitors have been almost as varied as the statistical programs of the Bureau. Emphasis has been placed upon particular subjects in response to the requests of cooperating Governments and the interests of the individual. The training is carried out by organized reading of basic source materials, by seminars, and by lectures. Conferences are arranged with experts from the operating divisions of the Bureau and whenever possible, the visitors are given the opportunity to observe the work of the divisions at first hand. These procedures are discussed as they have been developed in the United States, and every effort is made to encourage criticisms and evaluations from the students and visitors and to consider and discuss the modifications which would be necessary to compile such statistics in their own countries. These discussions are very instructive for the staff of the Bureau as well as to the visitors, and materials relating to techniques used in other countries are carefully studied.

Formal class-room courses which have been taught include:

1. Employment, Hours, and Earning Statistics from Establishment Reports.

A survey of such statistics compiled by all United States Government agencies and a detailed study of BLS techniques.

2. Labor Force and Occupational Outlook Statistics.

A survey of statistics in the field. Students spend time in study at the Bureau of the Census and Bureau of Employment Security through the courtesy of those agencies, as well as at the Bureau of Labor Statistics.

3. Statistics of Prices and Cost-of-Living.

A detailed study of BLS methods of price collection and computation of indexes of primary market and consumers' prices. Methods of conducting family expenditure studies and of compiling "family budgets" are discussed in broad outline. (In addition some students have specialized in this field).

4. Techniques of Productivity Measurement.

Methods used by the Bureau in compiling produc-

tivity statistics both from secondary sources and by direct contact with establishments.

5. The Statistical Programs of the Bureau of Labor Statistics.

A lecture course including explanations by division chiefs or their staffs of the operating statistical programs of the Bureau.

6. Mathematics Essential for Labor Statistics.

Practice in computing index numbers of various types and in the application of other statistical methods; discussion of the elementary concepts of sampling theory and its applications in the Bureau's work. (Some students have also taken a special course in sampling at the Division of Statistical Standards, Bureau of the Budget.)

Depending upon the interest of individual students, study courses are arranged in such fields as industrial accident statistics, occupational wage-rate studies, statistics of industrial relations, inter-industry relationships and other fields.

Most courses include field work to visit BLS Regional Offices, State Unemployment Insurance Agencies, State Labor Departments, industrial establishments, university research departments, and other institutions.

Since 1946, a total of 97 students and foreign visitors have studied statistical techniques in the Bureau for periods of 3 months or more. Forty of these full-time students were awarded grants from the Latin-American Republics. These 40 students, spending on the average 9 months in the Bureau, have specialized in the statistical techniques used in compiling the more important BLS series of employment, hours, earnings, and price statistics. In general they have been employees of Government statistical agencies. Many now hold responsible statistical positions in their countries.

Under a joint project of the Bureau of Labor Statistics and the Economic Cooperation Administration, European statisticians sponsored by the Organization for European Economic Cooperation have studied for 3 months each in the Bureau of Labor Statistics during 1950. The majority of the visitors have received intensive training in BLS methods of productivity measurement. Others have studied compilation of employment and labor-force statistics in the United States. These experts have spent some time at the Bureau of the Census, and the Bureau of Employment Security. The work of these visitors is directly related to the proposed establishment of productivity centers in ECA countries. The three teams included 46 distinguished economists and statisticians from Government, labor, and industry in Great Britain, France, Belgium, Italy, Germany, Austria, The Netherlands, and the Scandinavian countries.

Other visitors have been financed by their own Governments or from other sources. Statisticians from Japan, India, Ireland, Ecuador, and Bolivia have worked in the Bureau for 3 months or more under such auspices. Since 1946, in addition to these regularly programmed visitors, nearly 500 others sponsored by other agencies, particularly ECA, were received in the Bureau for brief periods and heard summary lectures on its basic organization and end-products.

Another Opinion Concerning Statistical Training Below the College Level

by WILLIAM DOWELL BATEN, Michigan State College

Introduction. I read, with a great deal of interest, the article "Statistical Training Below the College Level," which appeared in *The American Statistician*, February, pp. 6-7, 1950. I agree with the author, that there is a great deal of subject matter taught in college, that can be mastered by high school students. These young people, after graduation may be able to use successfully much of this material.

College courses which may be grasped by high school students. Since very few rigid proofs are given and required in a first course in calculus, there is no reason why many of the high school boys and girls can not understand a large majority of the subject matter usually offered in sophomore calculus. They can be taught, without a great deal of effort, to differentiate and integrate most of the functions required in this course; they can also apply differentiation to solve maximum, minimum, and plotting problems, and also apply integration for securing areas, lengths, surfaces, volumes, etc. Most of the ideas pertaining to limits presented to sophomores in colleges can be comprehended by these precollege people.

After high school students have studied arithmetic and geometric progressions they can understand all of the subject matter that is given in most college courses in mathematics of finance. They will be able to find partial payments, terms of annuities, present values of contracts, yields of bonds, perpetuities, etc.

The majority of our secondary school students are capable of making charts, of finding averages, of calculating medians, standard deviations, correlation coefficients, best fitting linear functions to observed data and of understanding much of sampling theory. Many of them will be able to apply successfully this material when on the job.

There is very little in analytical geometry given in a first course in college that can not be readily mastered by precollege students.

Colleges duplicate much of the work performed by high schools. The fact that these high school young people can comprehend the subject matter in many of the courses offered in college does not justify their incorporation into our high school curriculums. These schools already have full schedules and are having no small amount of difficulty in successfully executing them.

Since some freshmen enter college without entrance units in plane geometry or elementary algebra, many colleges are offering courses, without college credit, in these subjects. College teachers are now called upon to give instruction in these pre-college courses.

A large majority of the subject matter taught in many of the colleges in college algebra is usually offered in a two-year course in algebra in many of our high schools. A real course in college algebra is almost extinct. A large majority of the college students offering 1½ or 2 units of algebra find very little new material in their course in college algebra. In fact, many students consider that the majority of

the time devoted to this work is wasted. Since some colleges have such low standards pertaining to algebra (low standard here means that the majority of the subject matter given in college is given by high schools) it appears as though the colleges consider that high school training in this subject is inadequate for future study in mathematics, and hence duplicate much of what the high schools have already given.

Some colleges, after experiencing a large percentage of failures in freshmen chemistry, introduced a non-credit course in "chemical arithmetic" because of a large majority of the difficulties encountered pertained to arithmetic. After this course was initiated the percentage of failures in freshmen chemistry dropped appreciably.

Much of the subject matter taught in college English and biology is a duplication of material taught in the high schools.

Many college freshmen do not know how to place the decimal point in multiplication and division problems and also do not know how to add, multiply, and divide simple fractions. Most of these difficulties pertaining to elementary mathematics are brought about because secondary school subjects in this field were not mastered.

The reason our high schools are graduating students who are not prepared for college freshman mathematics is because not enough time is allowed for high school mathematics. Many colleges are attempting to make up these deficiencies.

No criticism of high school teachers. I do not criticize the high school teachers, because they are better prepared to teach their subjects than many of our freshman college teachers. In some colleges many sections of freshman mathematics courses are taught by graduate assistants, part time instructors and young instructors who have very recently received the Ph.D. degree; these people usually have had very little classroom experience as teachers. In many instances teachers of high school mathematics are people who are well educated, well trained as teachers and who are more mature than the former group. These secondary school teachers have had many years of classroom experience; their judgment is far superior to many of the college freshmen mathematics teachers.

Statistics requires more maturity than most pre-college students possess. If the study of statistics is going to be fully useful to any one, it must contain a large amount of interpretation based upon probability theory. The ability to make proper interpretations comes with maturity. High school young people do not have this maturity and hence can not receive the greatest amount of benefits from a course in statistics. If a course in this subject were offered in our high schools with their present crowded schedule it would burden the secondary schools with excess subject matter which would replace much more essential subject matter for these young people at this stage in their development.

Preparation of Effective Lantern Slides

by L. S. BONNELL

General Slide Copy Requirements

The use of a specialized procedure in preparing the original copy is essential if a slide is to be effective, legible and easily understood. It is never safe to use any conveniently available copy without first making sure that it meets certain necessary specifications.

In order to ensure a legible projection, the size of the copy and of the lettering used must bear a definite relationship to the projection width and to the maximum distance of the audi-

ence from the projection, as explained later.

For standard $3\frac{1}{4}$ x 4-inch slides, the height of the full slide field in reading position is about $8/10$ of the width. Whenever it can be done without distortion, the slide copy should be proportioned accordingly if maximum use is to be made of the full slide field.

Choice of Subject Matter

The most effective slide is one that incorporates brevity, clarity and simplicity.

FIGURE 1

RECOMMENDED DIMENSION AND LETTERING SPECIFICATIONS FOR SLIDE COPY FOR $3\frac{1}{4}$ x 4-INCH SLIDES

Basis: Dimensions and corresponding lettering sizes tabulated below will be satisfactory when $A/P = 6$, where

A = Maximum distance of audience from projection (feet)

P = Width in feet of projection with full size standard slide mask (3 inches wide, $2\frac{3}{8}$ inches high).

When the value of A/P is much different from the above, copy dimensions should be computed from the formula given in Fig. 2.

Maximum Allowable Copy Dimensions (Excluding Margins) in Inches (1)		Number (2)	Recommended Pen Number		
Width	Height		Minimum Size Lettering-Template	LeRoy	Wrico
6 $\frac{1}{2}$ (3)	5 $\frac{1}{4}$ (3)	100	00	-	
8	6 $\frac{1}{2}$	120	0	7	
9 $\frac{1}{4}$	7 $\frac{1}{2}$	140	1	7	
11 $\frac{1}{4}$	9 $\frac{1}{4}$	175	2	6	
13 $\frac{1}{4}$	10 $\frac{1}{4}$	200	2	5	
16	12 $\frac{1}{4}$	240	3	4	
19 $\frac{1}{4}$	15 $\frac{1}{2}$	290	4	3	
23 $\frac{1}{2}$	18 $\frac{3}{4}$	350	5	3	

1. These dimensions (rounded values) refer to copy in reading position and only to subject matter which will appear on the screen when using a full size standard slide mask.

2. These numbers, equivalent to the letter height in inches $\times 1000$, refer to templates furnished in LeRoy or Wrico lettering sets.

3. This size is satisfactory for bold-face Pica Gothic typewriter capital letters.

To obtain these qualities, the principles below should be observed:

1. A slide should present one and only one central idea.
2. Two slides, each conveying its message clearly and forcibly, are better than a single crowded one that may confuse the audience.
3. A slide need not be entirely self-explanatory, because it is supplemented by the speaker's explanation.
4. Only the items to be mentioned specifically in the presentation should be included, preferably in the order required.

Dimension and Lettering Specifications

Figure 1 shows the maximum allowable copy dimensions corresponding to the different lettering sizes listed, when the projection conditions will be those specified ($A/P=6$). These conditions may be considered as fairly typical. For other projection conditions, the allowable copy size should be computed using the formula in Figure 2.

Hand-lettered copy made in black India ink with either a LeRoy or Wrico lettering set is preferred. To ensure legible lettering, the following precautions should be observed:

1. Capital letters of any convenient size can be used; however, the smallest letters must correspond to the maximum allowable copy width (or height) selected from Figure 1, or computed from the equation in Figure 2.
2. If lower case letters are used, the copy dimensions should be about half of those specified in Figure 1.
3. Lettering formed with lines that

Editor's Note: This is a very much condensed version of an article that originally appeared in *Chemical and Engineering News*, September 12, 1949. This article explains briefly how to prepare either standard or 2 x 2-inch slides of tables, graphs, process flowplans, and maps, and how to obtain good typed copy. The original article is well illustrated and should serve as a useful working guide for preparing effective slides. A limited number of reprints of the original article are available from the author, at the Standard Oil Development Company, Esso Laboratories, Process Division, P. O. Box 121, Linden, New Jersey.

are appreciably thinner or thicker than specified for a given template will not be satisfactory.

4. Spacing between lines should be at least equal to the letter height to facilitate rapid reading.

Typewritten copy done on an ordinary typewriter equipped with a cloth ribbon is usually unacceptable. However, a typewriter having bold-face upper case Pica Gothic letters and numerals (0.1-inch high, 10 spaces/inch) and equipped with carbon paper ribbon (hard grade) will make very good copy. The paper used should be a smooth, hard surface, high-quality material, free of ripple and grain.

Choice of Type of Slide

Although positive slides are more conventional, negative slides (white on black) have the advantage that they can be readily hand colored, thereby enhancing clarity and appearance. Kodachrome slides are also very effective although, similar to negative slides, they require a well-darkened auditorium to be fully effective.

Legibility Tests

Visual examination at a prescribed distance of either a slide or the slide copy provides a convenient and rapid means of predicting in advance whether or not a slide will be clearly legible to the en-

FIGURE 2

FORMULA FOR COMPUTING SLIDE COPY DIMENSIONS

The following equation can be used for computing the maximum slide copy width:

$$C = \frac{400 P \cdot H}{A}$$

where C = Maximum allowable width of copy in inches, excluding margins, when in reading position

H = Height in inches of minimum size lettering (capitals) selected from Figure 1

A and P are defined as in Figure 1
Maximum copy height = $0.8C$

Note: When the copy height/width ratio exceeds 0.8, the copy height controls the reduction involved in making the slide; hence this must not exceed 0.8 of the maximum allowable width.

tire audience. With reference to those in the back row of the audience, the legibility that the projection of a $3\frac{1}{4} \times 4$ -inch slide will have can be predicted accurately by viewing the slide itself at a distance in inches equal to $3(A/P)$, or 18 inches when the copy has been sized and lettered as specified in Figure 1. The projection legibility

can be judged also from the copy so prepared by viewing the copy at a distance in feet equal to one-half of the maximum allowable copy width in inches. (Height should not exceed about $8/10$ of this width.) Example: Copy 8 inches wide by $6\frac{1}{2}$ inches high should be readily legible at 4 feet when printed with a No. 120 template.

NEWS CONTINUED FROM PAGE 5

Pacific Coast Committee on Social Statistics Social Science Research Council

Members 1950-1951:

Maurice I. Gershenzon
California Department of Industrial Relations
Emily Huntington
University of California, Berkeley
George M. Kuznets (Chairman)
University of California, Berkeley
Davis McEntire
University of California, Berkeley
Calvin F. Schmid
University of Washington
Jacob Yerushalmi
University of California, Berkeley

Since 1941, the year of its inception, the Committee has attempted to serve as a clearing house for statistical projects on the Pacific Coast; to offer suggestions to data collecting agencies pointing to improvement of procedures in collecting and organizing statistical data; and to delineate areas of inadequate knowledge and stimulate research in these areas. The Committee has sponsored numerous conferences and has devoted much attention to bringing together university personnel and representatives of public agencies concerned with recording statistical information.

During the past year, the principal conference sponsored by the Committee dealt with problems of measurement of regional income. The first day of the conference, which was held in Sacramento, California, in May, was devoted largely to an appraisal of the state income payments series of the Department of Commerce; the remainder of the conference dealt more specifically with problems of income measurement in California, Oregon

and Washington. A report of the proceedings of this conference is being completed. The conference participants included members of departments of economics and schools of business in the principal universities on the coast and from several state and privately endowed colleges; representatives of state agencies and several members of federal bureaus.

To help bring about closer working relations between mathematical statisticians and social scientists on the Pacific Coast using statistical tools the Committee initiated a series of conferences on statistical techniques. Probabilistic models underlying classification techniques and the application of the latter to certain specific problems such as identification of accident proneness were discussed in the two conferences sponsored by the Committee during the past year.

An annotated inventory of source materials and research projects in social statistics on the Pacific Coast is being prepared to provide research workers, administrators, and others interested in social statistics with information concerning recent and current work in the field. The first such inventory was compiled and published by the Committee in 1944. The present compilation will include studies initiated since January 1944 pertaining to California, Oregon, Washington and British Columbia, and covering the following topics:

- (1) *Population*: Growth and distribution, births and deaths, marriage and divorce, migration, composition and characteristics.
- (2) *Labor*: Employment and unemployment, wages, hours and earnings, industrial relations and personnel practices, industrial injuries and safety.
- (3) *Personal Income*.
- (4) *Planes and Standards of Living*.
- (5) *Health*.

QUESTIONS and ANSWERS

edited by FREDERICK MOSTELLER

Harvard University

We have received a number of questions dealing with classical combinatorial problems and duration of play problems. These questions arise so often and the interest in them is so

great that we have decided to publish some of them even though the results are available in the literature, some results going back 400 years.

THE BALLOT BOX PROBLEM

Question 27. Two candidates *A* and *B* have *a* and *b* votes respectively, $a > b$. If ballots are chosen at random, and a tally is made of the votes for *A* and for *B*, what is the chance that at least once after the first ballot is chosen *A* and *B* will have the same number of tallies?

Answer. We are really concerned with the proportion of the possible tallying sequences that produce at least one tie. Consider those sequences in which the first tie appears when exactly $2n$ ballots have been counted $n \leq b$. For every sequence up to the tie in which *A* is always ahead, there is a corresponding sequence in which *B* is always ahead. For example, if $n = 4$, corresponding to the sequence

AABABABB

in which *A* leads until the last, there is the complementary sequence

BBABABAA

in which *B* always leads. This sequence is just the mirror image of the first sequence, *A* replacing *B*, and *B* replacing *A*. Now, given that there is a tie, there must be a first one, and there are just as many sequences leading to a first tie with *A* ahead as there are sequences leading to a first tie with *B* ahead. The trick now is to compute the probability of getting a first tie with *B* ahead. Since *A* has more votes than *B* altogether, *A* must ultimately be ahead. If the first ballot is a *B*, then there must be a tie sooner or later; and the only way to get a first

tie with *B* leading is for *B* to receive the first tally. The probability that the first ballot is a *B* is just

$$\frac{b}{a+b}.$$

But there are just as many sequences resulting from the first ballot being an *A*. Thus the probability of a tie is exactly

$$P(\text{tie}) = \frac{2b}{b+a} = \frac{2}{1+r},$$

where $r = a/b$. We note that when *a* is much larger than *b*, that is, when *r* gets large, the probability of a tie tends to zero (a result that is intuitively reasonable). And the formula holds when $b = a$, because we must have a tie and the formula gives unity as the probability. To check an example in detail, consider the case $a = 3$, $b = 2$. The 10 possible sequences are

1. AAABB	6. ABABA
2. AABAB	7. BAABA
3. ABAAB	8. ABBAA
4. BAAAB	9. BABAA
5. AABBA	10. BBAAA

Of these, the sequences 3, 4, 5, 6, 7, 8, 9, 10 lead to at least one tie each. The probability of a sequence with a tie is $8/10 = 4/5$, both by direct count and by substitution in the formula.

This approach to the ballot box problem was suggested by Mr. Benjamin Graham.

TIES IN COIN TOSSING

Question 28. Players *A* and *B* flip a fair coin *N* times. They keep a tally of their score. What is the chance that they will never have equal scores?

Answer. This is a variant of Question 27. An extension of the method described in that question can be used to show that the probability of not getting a tie is (for *N* odd and *N* even)

$$P(\text{no tie}) = C_k^{N-1} / 2^{N-1}, \quad N = 2k+1$$

$$P(\text{no tie}) = C_k^N / 2^N, \quad N = 2k,$$

where C_y^x is the number of combinations of *x* things taken *y* at a time. The formulas show that the probability is the same for an even *N* and for the following odd number *N*+1. For example, when *N* = 4 the second formula applies. The 16 possible outcomes are

AAAA*	BAAA	ABBA	BABB
AAAB*	AABB	BABA	BBAB*
AABA*	ABAB	BBAA	BBBA*
ABAA	BAAB	ABBB	BBBB*

where the star indicates no tie occurs. Since the combination $N4 =$ things taken $k=2$ at a time is 6, the formula checks.

For even values of *N*, Stirling's approximation gives

$$P(\text{no tie}) \approx \frac{2}{\sqrt{2\pi N}} \left(1 - \frac{1}{4N}\right) \approx \frac{.8}{\sqrt{N}}.$$

Even for *N* = 2 the first approximation on the right is very close, giving .495 instead of the correct .500.

PROBABILITY OF RUIN

Question 29. Player B has a fortune of b units, and on a single trial has a probability q of winning one unit and a probability p of losing one unit, with $p+q=1$. The house has an infinite bank. What is the probability that B is ruined at exactly the N th trial? What is the probability he will ultimately be ruined?

Answer. In two articles entitled "The duration of play", and "The game of heads and tails", *Biometrika* 22 (1930-31) pp. 377-404 and *Biometrika* 23 (1931) pp. 419-423, E. C. Fieller handles problems such as these. He also supplies some interesting historical background. To give a later reference, W. Feller, *An Introduction to Probability Theory and its Applications*, John Wiley & Sons, New York: 1950, discusses such problems in Chapter 14 entitled "Random walk and ruin problems".

We give without proof some results drawn from Fieller's article. If the bank is infinite the player must have a positive advantage ($q > \frac{1}{2}$) if he is to have any chance of not being ruined in the long run. If the reader identifies himself with the player, he will know that such advantageous games are rarely found in practice. Given a positive advantage his probability of ruin is $(p/q)^b$, so that if the player's probability of winning on a single trial is $q = 2/3$ and he starts with one unit, he has a 50-50 chance of staying in the game forever.

When the house has a units, the probability of B 's ultimate ruin is

$$P(\text{ruin}) = \frac{1 - (q/p)^a}{1 - (q/p)^{a+b}} \quad p \neq q$$

$$P(\text{ruin}) = \frac{a}{a+b} \quad p = q = \frac{1}{2}$$

The first formula usually applies with $q > \frac{1}{2} > p$ and a much larger than b .

Suppose a roulette wheel has a 100 dollar bank and a single player with \$10 plays red or black against the wheel in one dollar bets, then $p = \frac{18}{34}$, $q = \frac{16}{34}$ (supposing there are two slots

for the house). Then application of the first formula gives the player's chance of breaking the bank as .0000053. Application of the second formula gives his chance as .0909. So the slight change to equal probabilities makes a tremendous difference in the player's chances.

If the bank is infinite the probability that player B is ruined at exactly the n th trial ($n = b+2i$, $i = 0, 1, 2, \dots$) is

$$(1) \quad \frac{b(b+2i-1)}{i!(b+i)!} p^{b+i} q^i$$

There must be an even number of trials in excess of b so that the player can lose once for every time he has won. Corresponding formulas when the house has a finite bank are rather lengthy and will not be given here.

In the special case where $p = q = \frac{1}{2}$ and the bank is infinite, there are approximations for the probability $P(n)$ that the player will be ruined on or before the n th trial, assuming n is large compared to b . Exact values can be obtained by summing (1).

One approximation is

$$(2) \quad P(n) = 1 - \frac{1}{\sqrt{2\pi}} \int_{-t}^t e^{-\frac{x^2}{2}} dx$$

$$t = \frac{b}{\sqrt{n'+3\delta}}$$

$n' = n$ if $n - b$ is even, $n' = n - 1$ if $n - b$ is odd.

A few calculations would be worth while to compare exact results from summing (1) and the approximation (2).

Case	Exact (1)	Approximation (2)
$b=1 \quad n=1$.500	.438
$b=2 \quad n=4$.375	.355
$b=2 \quad n=12$.508	.497
$b=6 \quad n=12$.0923	.0918

We note the error is quite large in the case $b=1$, $n=1$, but seems to become rapidly smaller.

NEWS CONTINUED

Inter American Statistical Institute "Statistical Vocabulary"

The Inter American Statistical Institute has published the first edition of a "Statistical Vocabulary" presenting the equivalents in English, Spanish, Portuguese, and French of approximately 1,800 words or phrases in common usage in statistical work. Various fields of statistical application as well as statistical science proper are included. The Vocabulary consists of a main list containing English terms with equivalents in Spanish, Portuguese, and French; separate Spanish, Portuguese, and French alphabetical indexes, each keyed to the English equivalents; and an appendix containing illustrations of graphic presentation with corresponding designations in the four languages.

Selection of terms included in the main list was generally made according to the following criteria: (1) Terms must have technical significance in methodological or applied statistics; (2) they must have a definite relation to work incidental to statistical research, compilation, analysis, and publication; (3) they must be terms designating subject-matter attributes which are generally treated statistically in tabular form, such as terms found in headings and stubs of tables in a statistical yearbook.

Population Censuses and Other Official Demographic Statistics of British Africa

Population Censuses and Other Official Demographic Statistics of British Africa is the latest in the series of annotated bibliographies issued by the Census Library Project of the Library of Congress and the Bureau of the Census. The series, designed to afford a world coverage of official publications of census and vital statistics, includes bibliographies for Europe and the Americas. All publications in this series are available at the U. S. Government Printing Office, Washington 25, D. C. The price of the publication mentioned above is 20¢.

The Public Health Statistician

The Public Health Statistician is the title of a pamphlet in the series "Careers With a Future" issued by the American Public Health Association, 1790 Broadway, New York 19, N. Y. It presents briefly the duties of a public health statistician and outlines the undergraduate and professional student requirements. A list of agencies which can furnish information on public health and of schools of public health are also shown.

Operational Research Quarterly

The first issue of the Operational Research Quarterly (March 1950), issued by the Operational Research Club, is a 15-page pamphlet containing an article on "Operational Research" by Professor P. M. S. Blackett, and a series of abstracts on various articles in the field.

As stated in the editorial notes "The main purpose of the Operational Research Quarterly is to assemble in one place as much as possible of the information that operational research workers now find (or fail to find) scattered widely over the very large body of scientific and technical literature. The method is to provide a quarterly collection of abstracts of relevant papers and articles, taken from as wide a field as possible."

The definition of Operational Research as used by the editors is indicated by the following statement: "... it is felt that the Quarterly may usefully regard as within its field the application of the scientific method to the provision of bases for executive action, in particular when the behaviour of people, either by themselves or in rela-

tion to their environment and equipment, is involved. It is possible that the Quarterly's scope will become more precisely defined as experience is gained."

The joint editors are Max Davies and R. T. Eddison, the address given is 25 Buckingham Gate, London, S.W. 1. The price is 10 shillings yearly.

NEWS about MEMBERS

Ralph Bedell assumed his new duties on August 1 as Chairman of the newly created Department of Psychology and Education in the School of Social Sciences and Public Affairs of The American University, Washington 6, D. C. Dr. Bedell previously was Professor of Educational Psychology and Measurements in the University of Nebraska.

Willis W. Clark, formerly Director of Research and Technical Services for the California Test Bureau in Los Angeles, has been advanced to the position of Executive Vice President in charge of Test Development.

William R. Davison received his M.A. degree in statistics from Missouri University on June 9, 1950 and has joined the staff of Stephens College, Columbia, Mo., as Assistant to the Research Director.

W. Edwards Deming was named honorary member of the Japan Statistical Association at its Eighteenth General Meeting held on July 7, 1950, in Tokyo.

J. V. DePorte, Director of the New York State Health Department Office of Vital Statistics, has been honored by the French Government for his distinguished work in the field of vital statistics and population studies. He has been made a Commander of the National French Order of Public Health.

Hope T. Eldridge formerly with the Bureau of the Census, and more recently with the Food and Agricultural Organization of the U. N., has joined the staff of the U. N. Statistical Office as Editor of the Demographic Yearbook.

Frank R. Garfield is now Advisor on economic research to the Board of Governors of the Federal Reserve System.

K Allyn W. Kimball, formerly Experimental Statistician with the United States Air Force School of Aviation Medicine at Randolph Field has received his Doctorate of Philosophy in Experimental Statistics from North Carolina State College and will be working on the Mathematics Panel at the Oak Ridge National Laboratory.

M Monroe Mendelsohn has been named Statistician in charge of Statistics of Sampling by Gould, Brown & Summey, Inc. of Chicago, a marketing consultant firm.

Margaret E. Moore is now serving as Acting Director of the Personnel Studies and Statistics Division of the Office of Industrial Relations of the Navy Department in Washington.

R Edith H. Rafton, for many years supervising medical insurance statistics assistant in the Statistical Bureau at the Metropolitan Life Insurance Company, is now Statistician at the newly opened Health Center sponsored jointly by the New York Hotel Trades Council and the New York Hotel Association. Free medical service is being given at the Health Center to over 35,000 hotel union members. Special emphasis is being placed on the preventive aspects of medical care.

S Robert T. Steffes, formerly with the Division of Statistics of the Bureau of Labor Statistics, has joined the staff of the Division of Statistical Standards of the United States Government to work in the field of inter-industry economics.

T Arthur T. Tait is now Director of Research and Technical Services for California Test Bureau at Los Angeles.

Dr. Ralph P. Boas, Jr., has resigned as Executive Editor of Mathematical Reviews, effective September 1, 1950, to become Professor of Mathematics at Northwestern University, Evanston, Illinois.

Dr. John V. Wehausen has been appointed to succeed Dr. Boas as Executive Editor of Mathematical Reviews. All correspondence regarding editorial matters should be directed to: Editor, Mathematical Reviews, Brown, University, Providence 12, R. I.

W Eric Weyl, Textile Engineering Consultant and Specialist in Cotton Spinning, has moved his office from Manchester, New Hampshire, to Charlotte, North Carolina.

Y Leo Younger, formerly market and sales analyst for the Bulova Watch Company has been named Manager of the Market Research and Sales Analysis Department for Willys-Overland Motors in Toledo, Ohio.

**STATEMENT OF THE OWNERSHIP,
MANAGEMENT, AND CIRCULATION
REQUIRED BY THE ACT OF CON-
GRESS OF AUGUST 24, 1912, AS
AMENDED BY THE ACTS OF MARCH
3, 1933, AND JULY 2, 1946 (Title 39,
United States Code, Section 233)**

Of *The American Statistician*, published monthly, April, June, October, November, at Washington, D. C., for October, 1950.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.; Editor, Sylvia Weyl, 1108 16th Street, N.W., Washington 6, D. C.; Managing editor, None; Business manager, None.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses, as well as that of each individual member, must be given.)

American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

SYLVIA WEYL.
Sworn to and subscribed before me this
18th day of September, 1950.
(Seal) **MARY P. WINDSOR,**
Notary Public.
(My commission expires April 14, 1954.)

CHAPTER NOTES

Periodicals
5201 Woodward
Detroit 7

ALBANY

At the Annual Meeting held in June, the following officers of the Albany Chapter were elected for the year 1950-1951: Mr. Max Weinstein, President; Mr. Murray Dorkin, Vice-President; Mr. James Russell, Secretary-Treasurer; and Mr. Karel Ficek, Chapter Representative.

BOSTON

At the June meeting of the Boston Chapter, "The Business Outlook for the Last Half of 1950," was discussed by: Paul T. Babson, President, United Business Service; Alfred C. Neal, Vice-President, Federal Reserve Bank of Boston; and E. Lafayette Quirin, Director of Research, Babson's Reports, Inc.

Mr. Joseph C. Bryan of the Massachusetts Institute of Technology presented a brief report on his research on the generalization of the discriminant function problem.

Officers elected for the year 1950-51 are: Roswell F. Phelps, President; William W. K. Freeman, Vice-President; E. Lafayette Quirin, Treasurer; Wilfred S. Lake, Secretary; and Frederick Mosteller and Louis C. Young, Counselors.

COLUMBUS

Officers and chairmen of the Columbus Chapter for 1950-1951 are as follows: William Papier, President; Mrs. William H. Haney, Second Vice-President; Michael V. Condoide, Secretary-Treasurer; David W. Lattimer, Past President; John Main, Corresponding Secretary; Miss Mary Louise Mark, Chairman, Program Committee; Raymond F. Sletto, Membership Committee; and Melvin Koch, Public Relations.

DAYTON CHAPTER

The newly elected officers are:
President—Colonel R. H. Magee, Standard Register Company, Dayton, Ohio.

Vice-President—Mr. Kenneth V. Casey, 914 Manhattan Avenue, Dayton 6, Ohio.
Secretary-Treasurer—Mr. Cyril G. Peckham, University of Dayton, Dayton, Ohio.

DENVER

The first fall meeting of the Denver Chapter was held in September. Dr. Virginia Brown, Associate Professor at the University of Denver spoke on Multiple-factor Analysis.

DETROIT

Temporary officers assigned to reactivate the Detroit Chapter are as follows:

Jacar F. Stewart, President; William C. Flaherty, Vice-President; Andrew T. Court, Secretary-Treasurer. Committee chairmen are as follows: Oliver Baker, Program; John R. Stewart, Arrangements; Harriet Kelly, Membership; Carter M. Bowen, Constitutional; and Goldie Levinstein, Public Relations.

The Chapter is planning a series of dinner meetings on the second Wednesday in October and subsequent months through June 1951.

NORTH CAROLINA

The North Carolina Chapter elected the following officers for the year 1950-51: Jack Rigney, President; Paul Peach, Vice-President; and Francis Verlinden, Secretary.

PHILADELPHIA

The Philadelphia Chapter elected the following officers for the year 1950-51: Howard M. Teal, President; David C. Melnicoff, Vice-President; J. Hunter McDowell, Secretary-Treasurer.

Dinner meetings held during the past year included the following:

- Oct.—"Marketing Policy & Research." Speaker Wroe Alderson.
- "Probability Sampling." Speaker A. J. King.
- Nov.—"Industrial & Occupational Trends in Employment." Speaker Gladys Palmer.
- Jan.—"The 17th Decennial Census." Speaker Philip M. Hauser.
- Feb.—"The International Bank at Work." Speaker Wm. G. Wells.
- Mar.—"Forecasting—In Industry." Speakers Walter E. Hoadley, Jr., Adolph Abramson.
- Apr.—"Present Status of the ITO." Speaker Clair Wilcox.
- May—"Measuring Some Policies Governing Full Employment." Speaker Ewan Clague.

SACRAMENTO

The Sacramento Statistical Association focussed its 1949-50 programs on two problems: regional economic differences and the preparation of government reports. This is in general conformity with the interests of the 55 members, all of whom are either on the staff of State and Federal research organizations or the faculty of Sacramento State College. The schedule of programs was as follows:

September meeting. Reports on new developments in research techniques in State departments by Ronald Beattie of the Department of Justice, Ralph Currie of the Department of Finance, John

Marshall of the State Board of Equalization, George Scott of the Crop Reporting Service, Richard Morgan of the Department of Mental Hygiene and K. A. MacLachlan of the State Highway Planning Survey.

October meeting. Problems in presenting complex subjects to Legislative Committees, by Dr. Allan Post, Acting Legislative Auditor.

November meeting. The impact of business cycles on the California economy, by Dr. Frank L. Kidner, University of California.

December meeting. The way in which government reporting is handled in selected states, by Dr. Gilbert Lenz, Deputy Legislative Auditor.

January meeting. Significant differences in economic trends between regions of the United States and the problem of measuring them, by Joseph W. Rupley, U. S. Bureau of the Budget.

March meeting. Research problems in developing the reports of Governor Warren's Commissions on the Causes of Crime and the Enforcement of Criminal Law, by Mr. Malcolm Harris of the California Department of Corrections.

April meeting. Field methods used by the Bureau of the Census in the 1950 Census of Population and Census of Agriculture, by Mr. Richard Martin of the Sacramento District Office, U. S. Bureau of the Census.

May Meeting. Joint meeting with the Social Science Research Council's Conference on Income Estimates, Pacific Region. The preparation of regional income estimates, by Mr. Charles I. Schwartz of the National Income Unit, Bureau of Foreign and Domestic Commerce.

WASHINGTON

The September meeting was devoted to a discussion of the use of electronic computing machinery and statistical problems. Speakers were: Sam N. Alexander of the Bureau of Standards who gave a "Survey of Electronic Computers" and Benjamin J. Tepping, Bureau of the Census whose paper was "A Table for the Optimum Allocation of a Sample, Produced by the SEAC." The meeting was held at the National Bureau of Standards so that the SEAC computing machine could be demonstrated.

The October meeting of the Society was a dinner for Philip M. Hauser, sponsored jointly with the Washington Chapter of the American Sociological Society.

A series of about four meetings, to be held early in 1951, are being planned jointly with the Society for the Advancement of Management, to study high speed machines and their uses in statistics, with special reference to management problems.

